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AMERICAN ARTISAN and Hardware Record

VOL. 84. No. 24. 620 SOUTH MICHIGAN AVENUE, CHICAGO, DECEMBER 9, 1922. $2.00 Per Year.

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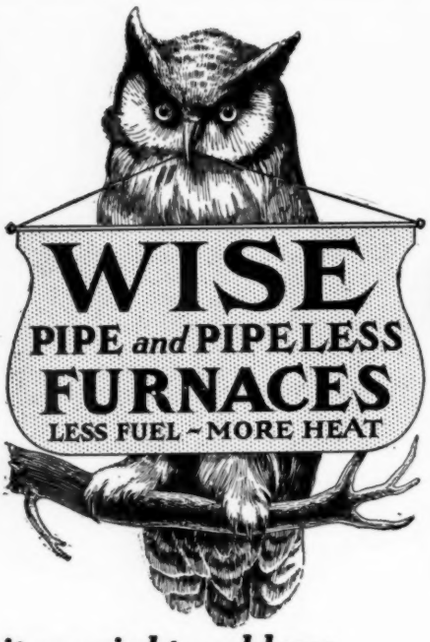

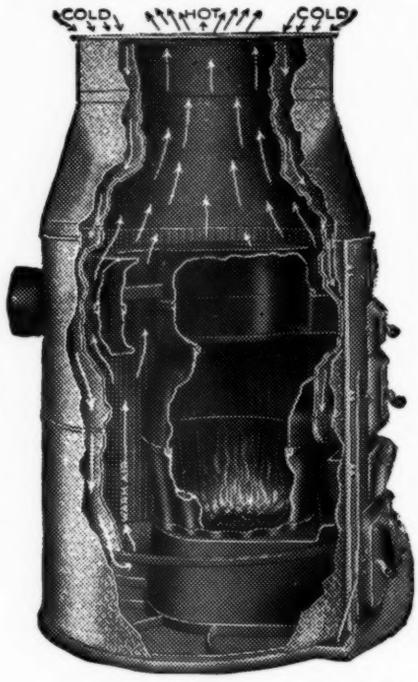

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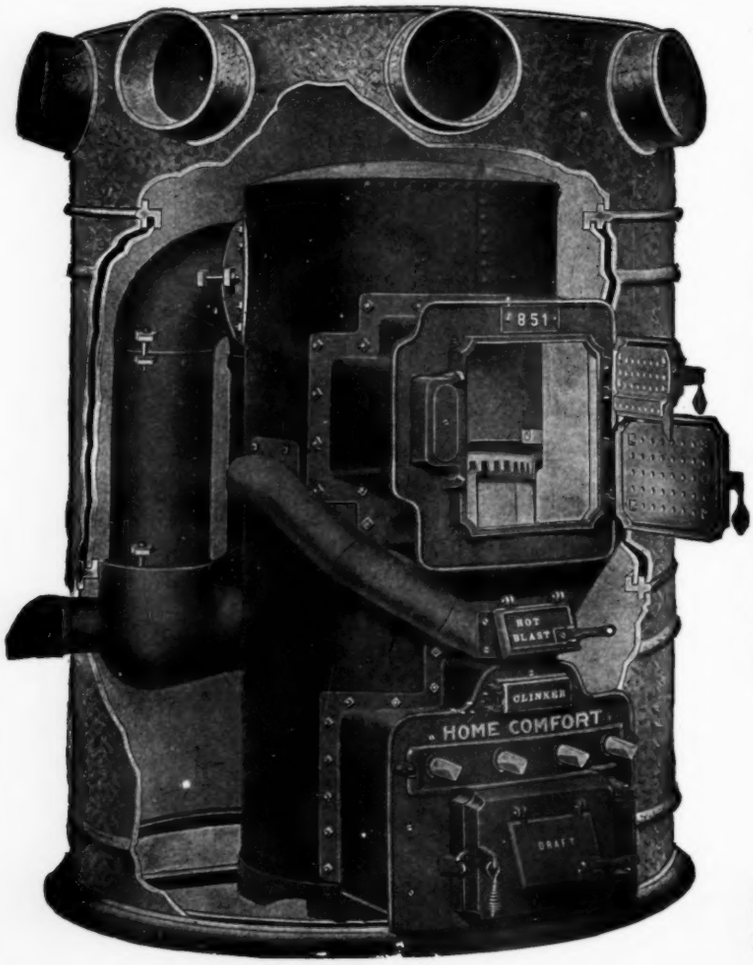

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AMERICAN ARTISAN and Hardware Record

Address all communications and remittances to AMERICAN ARTISAN AND HARDWARE RECORD 620 South Michigan Avenue CHICAGO, ILLINOIS

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VOL. 84. No. 24. CHICAGO, DECEMBER 9, 1922. $2.00 Per Year.

MAKE IT OF SHEET METAL!

Some years ago there was considerable talk about an educational campaign which was to be conducted for the purpose of acquainting the general public, architects and builders with the many advantages of sheet metal for building purposes.

The talk never got any further than the talking point, although off and on there were times when things began to look as if it might develop into definite positive action.

In the meantime, manufacturers of all sorts of prepared roofing, manufacturers of terra cotta, manufacturers of tile, manufacturers of slate, manufacturers of wood shingles, manufacturers of copper, manufacturers of zinc—manufacturers of every other material used for roofing, except those who make tin plate or galvanized sheets and shingles—have conducted strong advertising campaigns popularizing their particular products.

What has been the result?

All that could have been expected—what any sensible man would have expected.

Terne plate and galvanized roofing have had to take a back seat for other materials, some of which were far inferior and but little less expensive, while some were much more expensive and but little more durable.

There have been a few notable exceptions among the manufacturers of terne plate and galvanized roofing—either in sheet form or as shingles—who have been consistent in their efforts not only to keep up the quality, but also to keep the trade and the public fairly well informed as to the merits of their products.

But the great majority of manufacturers have almost let the sheet metal roofing go by default.

During the past year we have had two very interesting examples of what concerted and co-operative individual action will do.

We refer to the excellent campaigns conducted by the Copper and Brass Research Association and individual makers of sheet copper and zinc for roofing, gutter work and other building purposes.

One large roofing manufacturer who makes all kinds of metal roofing material stated to the writer a few weeks ago that during the first nine months of 1922 he had bought, converted and sold for roofing, gutter and kindred purposes, more than three times as much sheet copper as he had ever done in any twelve months of his long business experience.

A contractor told the writer that during the first ten months of 1922 he had laid more zinc roofs per month on an average than he had done before in a year—on dwelling houses.

The copper people were hard up—like every one else—when they got together and began boosting copper.

The zinc people were not so flush with financial resources that they could afford to throw a lot of money to the winds.

Still—They made a start.

And—They are reaping big returns.

When will the manufacturers of terne plate and galvanized roofing get into action?

Random Notes and Sketches.

By Sidney Arnold

C. H. Spaulding, of the Farris Furnace Company, took me to lunch the other day when he was in Chicago, and over the coffee and cigars told the following story:

He had just come out of the civil ministry to become chaplain of the regiment and was determined that, so far as he was concerned, day by day in every way the Army should grow better. One day he came across a group of men on their knees on the parade grounds.

"What are you doing, boys?" he inquired pleasantly.

"Shootin' craps," answered a voice.

"The idea!" exclaimed the new chaplain indignantly. "Don't you know that life is as precious to the little craps as to anything else?"

* * *

It does a fellow good to have two such breezy, optimistic callers as I did the other day, in Blair A. Quick and A. B. Meston, who are well enough known to the furnace and supply trade to need no further introduction. We swapped yarns until we had to call it a stalemate, and then talked shop. Both see a big year ahead in 1923 with everybody busy in filling orders. It does look that way.

* * *

I had a letter from Jim Triggs the other day and that in connection with the fact that Christmas is approaching reminded me of the following story which those who know of the generous proportions of the president of the Majestic Company will appreciate:

Dear little Johnnie's Aunt Emma, a lady of most generous build, had come for a visit and dear little Johnnie had been gazing at her raptly for some minutes. Finally he could stand it no longer.

"Mamma," he cried, "does Santa Claus fill everybody's stockings?"

"Of course, dear," replied his mother in some surprise.

"Grown-up people's too?"

"Yes, dear."

"Well," returned Johnnie doubtfully, but as one clinging to a shred of hope, "I hope he gets to mine first."

* * *

E. P. Wasson, of the Lennox Furnace Company, is responsible for the following story:

A gentleman having business with a back-country farmer inquired of the farmer's boy where the old man was to be found. "He's out in the pig-pen doctoring a sick shoat," replied the boy, and added as an illuminating afterthought, "Pop's the one with a hat on."

* * *

John L. Palmquist, of the Utica Heater Company, says that compliments are all right but there are occasions when what you want to be a fine compliment sounds just the reverse and here is an example:

"Thank you so much for your song, my dear. It took me back to my childhood days on my father's farm, and when I shut my eyes and listened to your singing I seemed to hear the dear old gate creaking in the wind."

* * *

George W. Diener, who makes Torrid soldering furnaces, ash cans and other household articles, is not particularly impressed with the red tape that so-called efficiency experts call system, even though he keeps his own organization pretty well oiled up for smooth running, and here is a story that he will appreciate:

During the flu epidemic at Camp Bowie base hospital, many of the doctors worked twenty hours a day. One rookie medico had a seventy-five-bed ward thrust upon him the first day of his army career. He struggled valiantly with his professional work, but failed to realize that he was now a soldier.

He forgot the sacred morning reports. He forgot to make out the sacred mess regulations. He exasperated everybody. Finally the colonel hauled him to the carpet and demanded:

"Why in the blankety-blank-blank don't you read your army regulations?"

"Army regulations?" he ejaculated. "Good Lord, colonel, I haven't even had time to read the newspapers!"

* * *

Whenever I am in Louisville I always drop in for a visit with W. H. Cloud, Secretary of the Southern Stove Manufacturers' Association, and usually we "swap" a couple of stories along with a glass or two of water cooled in one of his well known refrigerators. Here is one of his latest contributions:

A small boy in school refused to take part in a sewing lesson on the ground that it was beneath his dignity.

"George Washington sewed," said the teacher, taking it for granted that every soldier has to do it at times. "You don't consider yourself better than Washington, do you?"

"I don't know; time will tell," replied the boy.

* * *

Frank Ederle, who keeps on the go looking after the interests of the sheet metal contractors of Michigan, sent me a two-page letter the other day and finished up with the following story which he recommended for the consideration of our mutual friends:

Little Sambo came in crying on the first day of school.

"Well, what have we here?" cried the teacher sympathetically. "What is the cause of such grief, my little man?"

"Th-the bulldog in de nex' block. He done run out an' bahked at me."

"Well, that is no cause for tears. Why didn't you ignore him? Walk right past him? You should have spurned him with contumely."

"Y-yassum, dat's what Ah did—'ceptin' dat Ah missed him."

Western Warm Air Furnace and Supply Association Meeting Foresees Prosperity Era In Near Future

Speakers See Installation Code and New Spirit Of Cooperation as Profitable Factors In Industry.

AN OPTIMISM anticipating great prosperity in the near future, and a spirit of forwardness and cooperation marked the annual meeting of the Western Warm Air Furnace & Supply Association

R. W. Menk, Retiring President and Director, Western Warm Air Furnace and Supply Association.

held at the Sherman House, Chicago, Wednesday, December 6, which was further made memorable by the interchange of many worthwhile and practical ideas and suggestions.

The meeting was called to order by President R. W. Menk, who called upon Secretary J. H. Hussie to read the minutes and communications. A letter from E. B. Langenberg of the Code Committee expressed his regret at his inability to attend because of the work involved in the Haynes-Langenberg plant changes, but assuring the Association that corrections in the Code were being taken care of.

A communication was read from the U. S. Department of Commerce, complimenting the Association on its splendid progress as shown in the adoption of the new Installation Code, which had come to it as printed in AMERICAN ARTISAN AND HARDWARE RECORD. The communication suggested a further step forward in the recommendation of the department's plan to bring about a standardization and simplification in industry—in this instance, standardizing of warm air furnace fittings—and this recommendation was emphatically given approval in a resolution, a copy of which will be forwarded to Washington.

President R. W. Menk then delivered his annual address as follows:

Annual Address of R. W. Menk, President, Western Warm Air Furnace and Supply Association.

This day marks the close of another year for this association. It also turns a new clean page upon which we are to record the efforts we put forth in the coming year.

I am firm in my belief that the past efforts on the part of our members have done much to shape the furnace industry and that without a doubt will continue to do so.

The spot-light of the industry has been upon us almost from the start and without a doubt will continue to be if the plans and policies outlined are carried out.

What has been done is now past history and should urge us on to greater achievements.

While we, of course, take only a small portion of the credit of the formation and adoption of the furnace Code, it is without a doubt the biggest piece of work ever put over and cannot help but work for the benefit of the furnace industry, as its adoption by the three associations so vitally interested will make it a force that will cause warm air heating systems to be installed on a credit rather than a debit basis. The sooner all concerned get behind it and push it, the greater results will be shown. It is true that some are not agreed upon all of the clauses but such is to be expected and I doubt that it is possible to write a code that all will agree upon and without a doubt what faults it may contain will soon be brought to the surface and corrected or eliminated, but until then let us push it.

Our advertising and educational program has not made the progress expected. I am, however, sure that this coming year will show marked progress and another move in the right direction.

The matter of trade relations should have greater efforts put behind it, which is also true of the feature of standardization where there are many possibilities for uplift, economy and service.

The old saying that "in union there is strength" still holds good. We realize today more than ever before the need of organization. The power and ability of an association can do what no one man alone or even many men here and there, who have not organized, never can do. But organization requires effort, which is the price many are not willing to pay. Often times the men who condemn the same are those who are willing to do the least, and demand the most.

The organization, however, does not need you and I one-thousandth or one ten-thousandth as much as we need it. Live, active associations develop every phase of an industry for the ultimate good of everybody, from the making of a product to the final delivery in the hands of a happy and satisfied consumer.

The activities of this association have set off the alarm clock of the furnace industry several times and if I am not badly mistaken will ring the bell many more times in the future.

I have tried only to touch upon the past and the future in a very small part, knowing full well that there is much ground to be covered today and wish to say in closing that it has been a pleasure to have served you for the past year and to have become better acquainted and especially to have learned of your ideals and ambitions, as nothing succeeds as well as when members are closely of one mind and are willing to give and

R. W. Blanchard, Newly-elected Vice-President, Western Warm Air Furnace and Supply Association.

take when subjects have been discussed to the fullest extent.

There are many fine and uplifting matters that will come up before this meeting today. I am sure the clock will be wound up good and tight and will run well for another year and urge you to get behind my successor and give him every assistance and encouragement you possibly can.

Assuring you that my tugs are ready to be hitched to any job that is within

J. H. Hussie, Re-elected Secretary, Western Warm Air Furnace and Supply Association.

the limit of my position and ability, I thank you.

Then came Secretary Hussie's report for the year. As usual in his brief, optimistic way he referred to the healthy condition of the association—though no new members were taken in during the year because of business conditions, none had been lost—and mentioning the splendid part the association had taken in "putting over" the Code.

Treasurer Fehlig's report showed the Association financially in splendid condition with a nice surplus for the coming year.

H. R. Sims and E. L. Jaines were appointed to audit the books of secretary and treasurer.

One of the most instructive and interesting reports was that of Dr. John Wagner, chairman of the Publicity Committee, who laid particular stress upon the necessity of cooperation. In the opinion of his committee, Dr. Wagner stated, a national publicity campaign must emanate under the direction of the National Warm Air Heating and Ventilating Association with a committee formed from representatives from the National Association, the Western and the Midland Club. To be effective and economical a national advertising campaign must be conducted consistently under the guidance of a capable man to be employed by the National Association. To write copy and handle the affairs of such a responsible office, this man must have the undivided support of the associations and have freedom of action. Dr. Wagner's report, as usual with all of his talks, was received with great enthusiasm and a motion made that the Publicity Committee be continued.

Dr. E. Vernon Hill gave a detailed address on heating and ventilating, which he says are one and the same thing, and must not be separated. He laid stress on a humidifying attachment for the furnace as an absolute necessity. A vote of thanks followed the general discussion he evoked.

Chairman Dodd of the Legislative committee followed with his report, mentioning the splendid work of this committee which had accomplished much and gone farther in the past two or three years than ever expected. He expressed his appreciation of the support given him by the members of his committee and by the members of the Association which had made it possible for him to accomplish so much.

He showed step by step the work done in the preparation of the recently published Code, which had been adopted by the National Warm Air Heating and Ventilating Association, The National Association of Sheet Metal Contractors and the Western Warm Air Furnace & Supply Association and told how faithfully the committees had worked together.

Mr. Dodd's report was followed by general discussion amongst the members.

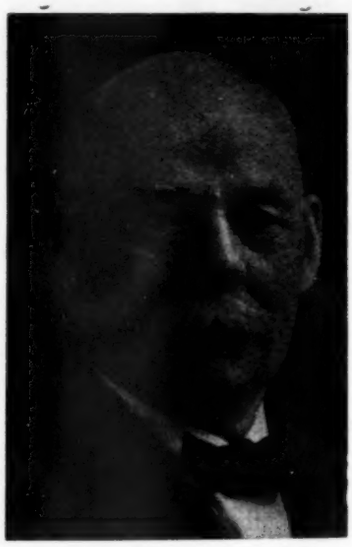
E. L. Jaines in his comment on the code said in his opinion, now that the code is an assured fact, it is up to the manufacturers to educate the heating and ventilating engineers, as well as the public, to the fact that the warm air furnace is just as good a system of heating as steam and hot water. He said it is time now for the furnace manufacturer to get away from his old practice of spending his time tearing down other furnaces and work for the uplift of the trade.

Mr. Dodd's report was accepted by the Association and placed on record for further consideration. To Mr. Dodd personally the Association expressed its thanks for the wonderful, consistent work he personally had done in putting over the Code.

After the appointment of the following Nomination Committee—F. L. Nesbit, Dr. John Wagner and H. W. Symonds—the meeting recessed for luncheon.

The afternoon session opened with a wonderfully instructive talk by E. B. Seitz, Secretary of the Washing Machine Manufacturers, on the work being done by his association. He told how they worked with the dealer and how their publicity and advertising campaigns are prosecuted successfully.

D. E. Cummings followed Mr. opened by Dr. Wagner, who start-



J. B. Fehlig, Re-elected Treasurer, Western Warm Air Furnace and Supply Association.

ed the ball rolling with another one of his "worth while" talks on cooperation and the necessity of closer relations and cooperation. "You can use the best registers, the best fittings that are made, but the job will be spoiled if the other side doesn't work with you," he said. "You

Seitz. His talk, different from the usual run of talks, was principally on constructive criticism and furnished many ideas.

R. W. Blanchard, Chairman of the Membership Committee, submitted applications of Meyer Furnace & Supply Co., Milwaukee, and of Charles Johnson Hardware Company of Peoria, Illinois, represented by P. A. Johnson at meeting, who had dropped in at the meeting to "listen" and had been so impressed by the spirit of real work of the Association he couldn't help joining.

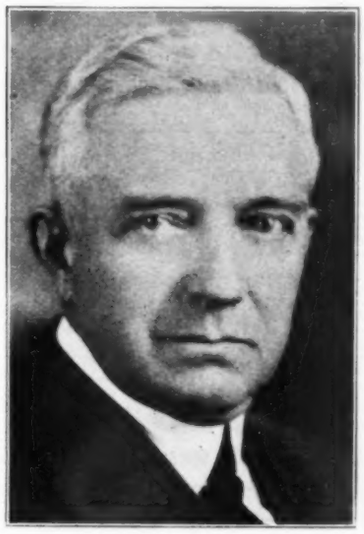
Harry Miller of the Summit Stove Works, Mr. Crick of the Independent Stove Company and C. H. Spaulding of the Farris Furnace Company, visitors, expressed their pleasure in being fortunate enough to attend this meeting and hoped their companies would soon become members.

The *Start Something Hour* was must be awake to the greatness of the problem—of heating homes properly so as to give *HEALTH, COMFORT AND HARMONY*

Otto F. Ahlig, Retiring Vice-President, Western Warm Air Furnace and Supply Association.

which are what men must have to be real men and create a home."

Herbert W. Symonds in his address extended an urgent invitation to the Association to meet at St. Louis next June during the convention of the National Association Sheet Metal Contractors. Others who responded included: J. Harvey Manny, Mr. Weichert, J. B. Fehlig, Joe Burgess, E. I. Dodd, Vern Parks, D. E. Cummings, E. L. Jaines, George Harms, C. H. Miller, R. W. Blanchard, F. L. Nesbit, Harry Hussie, Miss Etta Cohn, E. B. Hoy and R. W. Menk.



Dr. John P. Wagner, Newly-elected Director, Western Warm Air Furnace and Supply Association.

Resolutions were passed that a committee be appointed to formulate an instruction card to be used by all manufacturers; the card to have a footnote that it is the standard formula adopted by the Western Warm Air Furnace and Supply Association; also for a Committee to work on a standardized specification and estimate blank, and to again take up the matter of the rating of furnaces.

A report of the nominating committee next was made, in conformance to which the following were elected officers for 1923:

President, E. L. Jaines, Minneapolis.

Vice President, R. W. Blanchard, Chicago.

Sceretary, J. H. Hussie, Omaha, Nebraska, re-elected.

Treasurer, J. B. Fehlig, Kansas City, Mo.

Directors, R. W. Menk, Chicago, Illinois, and Dr. John Wagner, Des Moines, Iowa.

St. Louis, during the week of the National Association Sheet Metal convention next June, was chosen as the time and place of the next annual meeting.

President-elect Jaines was welcomed to the chair after which the new officers were introduced and the meeting adjourned.

Work, Honesty and Enthusiasm Sell Goods.

Frederick H. Bartlett, president of the Frederick H. Bartlett Company, real estate dealers in Chicago, in *System,* says there are three characteristics that dominate in every man who has ever sold successfully. "The first is work," he says. "Real selling is not easy. That ought to be self-evident; but time after time we have discovered men who pretended to be salesmen, who utterly failed to realize that selling and work are one and the same.

"The second characteristic is honesty. It is strange to have to say it, but many do not realize that they cannot sell and keep on selling, unless they are strictly honest: with themselves, with the firm, and, above all, with the customer.

"The third characteristic is more difficult to describe. It is a kind of driving force that makes men work fast. As good a name for it as I know is enthusiasm. It is a quality that appeals to the emotional nature of buyers and inspires them to act; and it is very important, for five sales are concluded by appeals to the emotions where not more than one is concluded by an appeal to the reason.

Attention, Installers, Which Plan Is Better?

Here is a problem in heat delivery which we pass on to our readers for solution. The problem is put by M. Clague, 2238 Central street, Bethany, Missouri, who also supplied the illustrative sketches produced herewith. In Mr. Clague's words, the query is:

"Enclosed find a pencil sketch of two ways to take off a warm air pipe. I claim that a warm air pipe, taken off a furnace as shown in Figure A, will give better service

than a warm air pipe taken off a furnace as shown in Sketch B.

"You will note in both sketches the length of run, and the rise from furnace to register. Figure A has

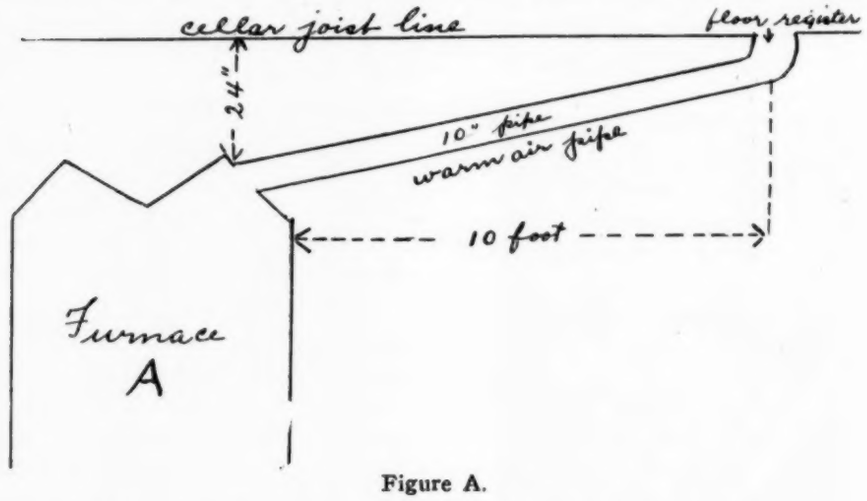


Figure A.

a 24-inch rise and Figure B a 12-inch rise.

"This is left to you to decide which would give the best service. Also would like to know the opinion of the readers of AMERICAN

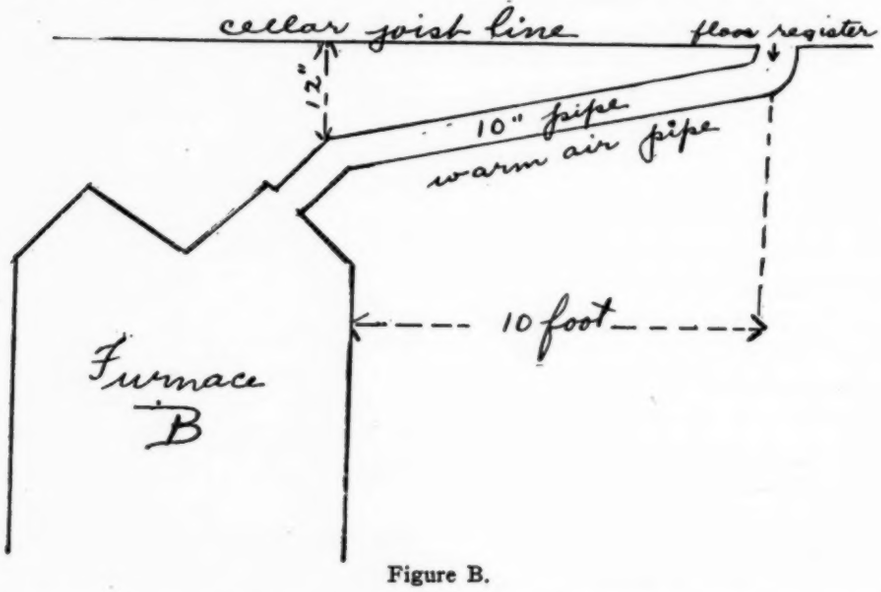


Figure B.

ARTISAN as to which would give the best service."

We hope that our installers will accept Mr. Clague's challenge. And we hope also that whether they agree or differ from Mr. Clague, they will set forth their reasons.

A Wonderful Discovery for Register Finish.

Isn't it so, that some of the best things you have found out for the benefit of your business were stumbled on accidentally?

Take the Victrola, for example. Some folks think Edison was trying to invent it and so that's why it came to be invented. Not so!

One day he was working in his laboratory on some electrical device in which a needle was used. The needle accidentally pricked his finger on a calloused spot and momentarily left the impression. It at once started Edison to thinking how he could rig up a needle that sound would force to prick some substance that could then be induced to give back or reproduce the sound itself.

So he schemed up a clumsy machine with a wax cylinder, and it worked. But even so, more than a quarter of a century went by before the machines reached their present perfection.

For another example, take old man Newton way back there, years and years ago. If he hadn't been sitting under an apple tree and accidentally hit on the head with an apple, who can tell how long it would have been before the vitally important laws of gravity or falling bodies would have been worked out.

Over a quarter of a century ago Tuttle & Bailey, the inventors and first makers of registers, were seeking a finish for them, that would be more attractive and have greater wearing qualitier than electroplating.

In the colored insert in this week's AMERICAN ARTISAN AND HARDWARE RECORD they tell in a most interesting way how the thing they sought so long ago was at last stumbled on. A *real discovery* it was.

Of course, if they had not been working for it all these years they wouldn't have recognized it when they did stumble on it.

Nor would they have known how to convert the crude thing of the discovery into the beautiful Tanbo finish.

In addition to the Japan and usual electroplate effects, you can now have a finish to match any wood desired. Baseboard registers can now be made to exactly match the woodwork. Think what that means on your fine jobs!

Pharaoh's daughter discovered Moses in the bullrushes; and you know what happened to the Red Sea and the Children of Israel as a result.

Edison accidentaly discovered the principle upon which the phonograph is based.

"Old Man Williams," as he is calied, of Tuttle & Bailey, discovered the secret that had been a quarter of a century in revealing itself. Williams found it, but it was F. T. Bailey who had the vision to see what the discovery really held. To him, so we have recently found out, is due the credit for the development of Tanbo finishes.

Ideas or discoveries are not worth a hoot, if not hitched up right. Inventions are generally dis-

coveries. Discoverers, however, are happily quite apt to be real practical folks like the rest of us.

When that happens, then something practical happens as in the case of Tanbo finishes.

"Buck" Taylor Made Sales Manager for Premier.

An announcement of more than passing interest to the furnace trade is made today by the Premier Warm Air Heater Company of Dowagiac, Michigan, by the selection of E. C.

E. C. "Buck" Taylor, Newly Named Sales Manager for Premier Warm Air Heater Company.

"Buck" Taylor as Manager of Sales. This marks another era of expansion for this well known Dowagiac concern.

"Buck" Taylor, as he is familiarly known to hundreds of the furnace fraternity, brings to this position a wealth of experience. Starting in life as a newsboy, he has, through constant endeavor, raised himself to a high position. After leaving High School he was employed for four years by the U. S. Steel Corporation, where a valuable knowledge of the metallurgy of iron and steel was acquired.

Foreseeing the great future of the heating industry, he severed that connection and went to work as a molder's helper, rising in rapid succession through the various jobs around a furnace plant to the position of foreman. Realizing the value of sales experience, he severed this connection and started some seven years ago as traveling salesman, and today enjoys a wide acquaintance with the trade throughout the Middle West.

With the exception of a few months spent in systematizing a furnace factory, Mr. Taylor has been in close contact with the furnace buying public. The last few years Mr. Taylor has devoted his time to the state of Wisconsin. He is a member of the State Auxiliary to the Wisconsin Sheet Metal Contractors' Association, of which he was one of the founders and charter members and has twice been elected President of that body.

Gives Heating Suggestions to Save Coal Pile.

In view of the probable coal shortage this winter, W. H. Driscoll, in the Chicago *Tribune,* gives the following advice as to the operation of a heating plant:

A good draft is essential to proper combustion. Therefore the chimney should be absolutely tight and the smoke connection as short and straight as possible. A hand damper should be installed in the smoke pipe to regulate the intensity of the draft. This should be installed in addition to any other mechanically operated dampers that may be in use.

The heater base should be tight and closely fastened to the floor to prevent air leakage into the ash pit. All flue fire and ash pit doors should be filed and fitted to make tight joints.

Heating surfaces should be kept clean and free from soot and ash accumulations, and the entire ash pit should be cleaned once a day; grates should be kept in good condition, so that they will shake easily and have no broken places for coal to drop through. Unburned or partly burned coal should not appear in the ashes at any time.

Steam heaters and hot water piping should be completely covered with a good grade of insulation of ample thickness to prevent heat losses. The firepot should be kept filled at all times. It is a mistaken notion to assume that a low fire effects economy. On the contrary, it is wasteful and extravagant.

Do not shake your fires too often, too long, or too violently, especially in mild weather. Regular attention to the fire by one member of the family is desirable.

The firepot should have sufficient coal capacity to require attention not more than once in eight hours.

Keep your house temperature lowered. Sixty-six degrees should be sufficient for comfort. If you are not comfortable at this temperature you are not properly clothed or the humidity in your house is too low.

Shorten the heating season as much as possible. Do not start your heater with the first sign of cold weather. An open fireplace or a gas heater will furnish sufficient heat at the beginning of the cool season.

Heat as few rooms as the comfort of your family will permit. A tremendous waste is caused by the heating of unoccupied rooms.

To humidify a house heated by a furnace, place an evaporating pan in the hot air chamber above the firepot, supply it with water from a tank set at the same level by the side of the furnace.

If there is steam heat, use the steam from the coils to humidify. Watch the water in the boiler. A few electric fans properly placed will greatly facilitate heating. On occasions a fan placed at the opening of a register or in the air duct solves a heating problem.

Fans to move the heat away from the ceiling and toward the floor are helpful.

Contracts for more than $150,000 worth of ventilating equipment for public schools have been booked within the past month by the Carlson Bros. Sheet Metal Co., Superior, Wis., necessitating the enlargement of the works. A $40,000 contract is from Altoona, Pa.

Practical Helps and Patterns for the Tinsmith.

Aids to the Improvement of Craftsmanship and Business. News from Various Branches of the Sheet Metal Trade.

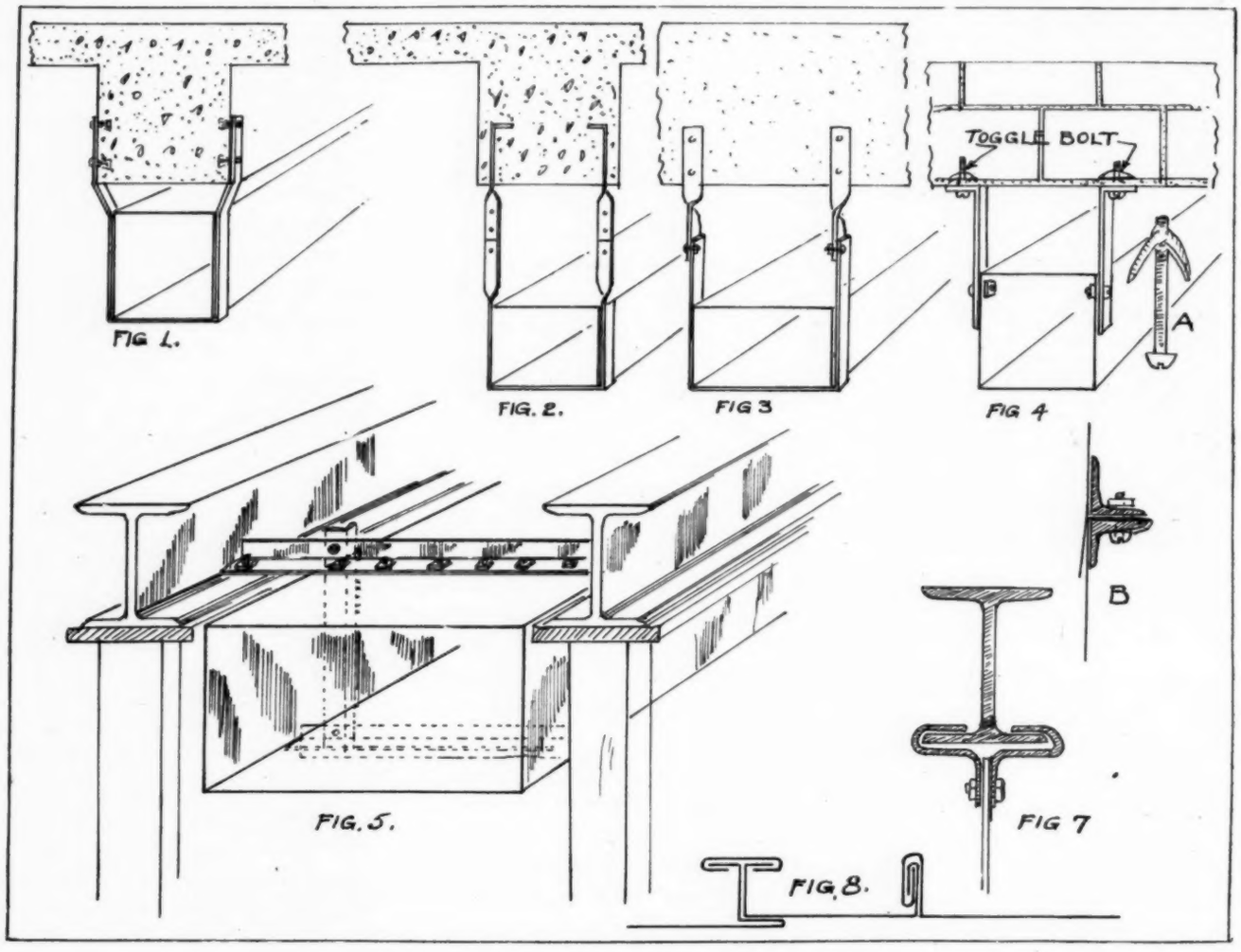
Hanging Ducts Continued.

By O. W. Kothe, Principal, St. Louis Technical Institute, St. Louis, Missouri. Written especially for American Artisan and Hardware Record.

In figure 1 we show how small ducts may be hung to a concrete beam by clamping a band around the duct and attaching to the beam by means of expansion bolts. This is done at intervals of every 4 feet or so, at least there are 2 hangers to an 8-foot length. Then at figure 2 we show how hangers are embedded in the concrete before setting. Then by means of additional straps, bent or twisted to suit conditions, several holes can be punched along which enables raising or lowering the duct to suit. Other times they can be arranged as in figure 3, where they are expansion bolted direct to the beam. Still at other times long rods are threaded and run directly through the floors to support wide ducts or several run of ducts. These angles are anchored to the floor with extra long threads on the bottom, are attached to angle irons laid underneath the ducts. Then these rods can be screwed up, thereby raising or lowering the work as required to make it perfectly level and straight.

In modern buildings where tile construction is used in the floors, these tiles are generally wedged, shaped and concreted in place. For such floors, and on small ducts as in figure 4, toggle bolts as at A are used. These are very serviceable for such work as they can be inserted in drilled holes, after which the wings will expand and enable tightening up. But for heavy ducts it is better to run a long bolt through the floor and anchor with a plate at the top, since that will make it safer and there is no liability of the tile pulling through as would be the case with a toggle bolt.

Sometimes with extra wide ducts, a construction feature as in figure 5 is used. An angle is bolted to the top of duct at intervals, and hung over the flange of the I-beam, where considerable vibration would be met with, a bolt would be set. To



Patterns For Hanging Ducts.

prevent the bottom of duct from sagging or buckling, an angle is also stretched across and either angle iron sides or rods are provided for supports. Vertical ducts on stacks are often joined together as at B and hooks for I-beams may be made as at figure 7. Many of these details must of course be adjusted to what a workman has to meet with. At times it is convenient to make joints as in figure 8 at certain places but even at that, certain slip joints are often designed to overcome this cumbersome joint.

New Sheet Metal Book Features Home Instruction.

Always instructive and useful are the books put out by William Neubecker, and his latest, just off the press, "Home Instruction for Sheet Metal Workers," edited by Frank X. Morio, is no exception, and will find a needed place in the work done by any live sheet metal man.

Practical in every detail, the book is really a series of illustrated instructions on architectural sheet metal work. It begins at the beginning and gives detailed instructions on cutting, forming, soldering, preparing full sized details from architects' blue prints, developing the patterns, laying out the work on sheet metal, forming and bending on the brake, and putting the work together when completed.

But perhaps the most unique feature of this work is a supplementary cover containing 14 large charts, giving full detailed drawings of many of the designs discussed in the book itself. From these working drawings can easily be developed, while the book itself gives full instructions for laying the work onto the sheet metal.

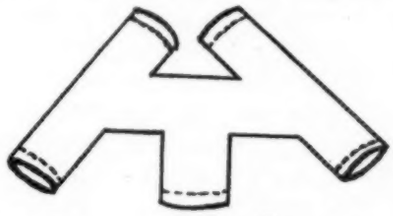
Some of the most important chapters of the book deal with lourves —stationary and movable—turrets, sash work, gearing and ornamental window caps. The subject of skylights is also well covered and includes flat, hipped and pitched. Indeed every subject taken up is dealt with in a complete and masterly fashion, so that it would not be difficult for even an apprentice to work out the problems with success.

The scope of the book, for the price, which is $5.00, is unusual, and we predict for it much popularity. It can be had through the Book Department of AMERICAN ARTISAN AND HARDWARE RECORD.

Writes for Pattern for Smoke-Stack.

AMERICAN ARTISAN AND HARDWARE RECORD is in receipt of the following self-explanatory inquiry:

I am mailing herewith a sketch of outline for a smoke stack, and was



wondering if you could get me patterns of that kind, or tell me where I could obtain such patterns. I wanted patterns for three different sizes, viz., 7 inch, 8 inch and 10 inch.

Yours very truly,
MAGNUS C. CHRISTENSEN.
Hemingford, Neb.
December 4, 1922.

Michigan Sheet Metal Men to Hold Important Meeting.

AMERICAN ARTISAN AND HARDWARE RECORD is in receipt of the following notice from F. E. Ederle, secretary of the Michigan Sheet Metal Contractors' Association:

The December meeting of our Trade Extension Board will be held in Detroit on Tuesday, December 12th, in the assembly room of the Detroit Associated Building Employers, 2002 Real Estate Exchange Building. Morning session will be called at 10 a. m. Several important matters will be discussed at this meeting.

The morning session will be devoted to a discussion of a proper financing for furnace dealers who are selling heating plants on a time payment plan. Representatives from all Michigan furnace manufacturers have been requested to attend. From the ideas given at this meeting it is hoped to form some kind of a financing company to better meet the competition offered by direct installers.

In the afternoon a representative of the National Slate Association will be present to explain the proposed program to be adopted by this organization to increase the use of slate roofing. This should make a very interesting topic as our board is very willing to do anything which will promote the use of better roofing materials and no doubt will take some action to co-operate with the slate organization.

Michigan Standard will come in for its share of discussion. This being especially true of the elbow and mitre proposition. Manufacturers of both will attend to ask that their product be accepted as the standard of Michigan.

Truly yours,
F. E. EDERLE.

Sheet Metal Locals to Study Budgeting This Month.

"Budgeting the Overhead Expense" is the theme suggested for study by sheet metal locals, according to a copy of the outline of points for description just received from Secretary E. L. Seabrook, National Association Sheet Metal Contractors. The outline follows:

Points for Discussion.

The membership is asked to discuss at the December meetings overhead expense, its probable amount for 1922, its application to 1923 business volume; and budgeting the same.

NOTE: The term "business volume" must not be taken as advocating a basis for applying overhead expense in estimating, but for bookkeeping purposes.

Will the overhead expense and business volume for 1923 be the same as 1922?

Can the 1922 overhead and its ratio to business volume of that year be fairly applied to 1923?

Is either of these liable to change? What has been your experience in this respect from year to year? If either change, will it not affect the ratio of overhead to business volume?

Is once a year frequent enough to compute the overhead?

Should not the amount expended for overhead be charged into the cost of the current volume of business and the overhead expense account closed, the same as other accounts are closed?

Budgeting.

A number of sheet metal firms are estimating or budgeting their overhead expense at the beginning of the month. At the end of the month the amount actually expended is charged to the cost of the current volume of business. This practice is becoming more and more

common in other lines of industry, allowance being made for seasonable dull and busy months in computing the budget.

Tying in the Overhead.

In good contract cost accounting all material and productive labor, etc., are accounted for, charged against certain contracts. If the budget shows, say, $1,500 expended a month for overhead, why should not every dollar of this be charged to the current contracts or business of the month?

If the overhead is budgeted every month, would it not show the exact amount spent during that period? If spent, should not every penny of it be charged to current contracts, the same as the amount of productive labor for the month and the account closed?

Use of Job Ticket on Sheet Metal Work Explained By Accounting Expert in First Lesson of Series.

Form Gives Up-to-Minute Cost of Job, Stops Leaks and Is Protection For and From Customer.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by George R. Doyle, Evansville, Indiana.*

THE forms to be used in the system of accounting to be described in these articles will be: a *job ticket, sales record* and *cash journal.* These are the forms to be used from day to day in making entries. A *ledger* and *monthly trial balance sheet* will also be part of the system.

In the natural course of events, a description of a bookkeeping system should logically start with the book in which the opening entry is to be made. This would be the *cash journal.* Since, however, the *job ticket* is used and referred to most frequently and since a correct form and proper use of this record is absolutely essential to successful accounting, we will begin with it.

Every reader is urged to study the illustration herewith very carefully. It is the original of the *job ticket.* When it is first made out, a sheet of carbon paper is used and the duplicate copy is torn out of the pad and given to the workman. The upper half of this duplicate is the same as the original, here illustrated. The lower half differs because only the office requires information regarding costs. The reverse side of both original and duplicate are exactly the same. (An illustration of the duplicate will appear in the next installment.)

In studying the form, herewith, you will note that space is provided at the top for all the information concerning the job. Sufficient room is given to fully describe the work

With this article, AMERICAN ARTISAN AND HARDWARE RECORD *begins the first of the special series prepared by George R. Doyle, formerly in charge of the Accounting Service Department of the National Trade Extension Bureau of the heating and plumbing industries, on accounting and costs in the sheet metal industry. The articles are prepared by an undisputed expert; they are easy and simple to understand. It is our belief that their study and the application of the lessons learned will not only turn loss to profit on many a job, but by fixing the actual costs to the satisfaction of the customer also, will do much to build up the business of the sheet metal man.*

to be done on jobbing or repair work. It is strongly advised that the contractor make proper use of this and give the workman all information that he has regarding the job *in writing.* This leaves no chance for "alibis" from journeymen for their mistakes by saying they did not receive proper instructions.

The figures across the sheet under "Mark Time Starting and Finishing" are to be used on small job work to indicate the time the job was started and completed. They are for the protection of the contractor in arguments made by the customer as to the amount of time charged. The time "starting" is marked in the office when the order is given out. The time "finishing" is marked on the duplicate by the journeyman and turned into the office. It is then marked on the original.

Note the three columns at the left, "Taken," "Ret.," "Used." When the order is made out, such material as is to be sent out to start the job is entered on both original and duplicate by using the carbon sheet The quantities are put in the "Taken" column. When any additional material is sent out it is like-

MATERIAL AND RETURN LIST

QUANTITY			ITEMS	COST		SELL	
Taken	Ret.	Used		@	Amount	@	Amount

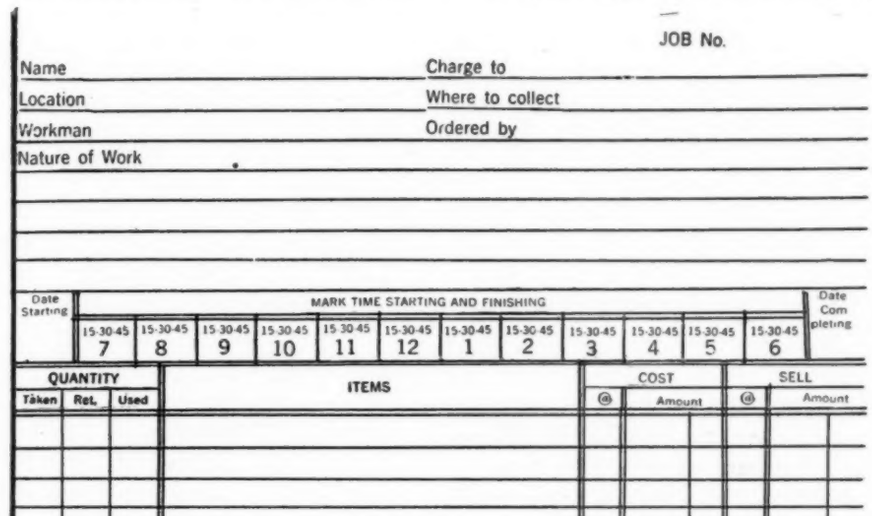
Reverse Side of Original Job Ticket.

*Copyright by George R. Doyle, Evansville, Indiana.

wise recorded on this sheet but not on the duplicate because that has gone to the workman. All material returned, either during the time the job is being done or when it is completed, is entered in the "Ret." column opposite the respective amounts in the "Taken" column. When the job is finished the differences on each item are extended into the "Used" column. This saves pricing material not used.

In the lower right-hand section under "Labor" is entered the time to be charged to the job. This information is to be obtained from the daily Time Card turned in by each journeyman. Each column headed "Hrs." is for one man and each line for one day. Space is provided for six men. If more than that number are engaged, journeyman and helper can be figured together at the combined rate.

The remaining lower section is the most important part of this form. By using it properly you will be able to know at all times how much money you have in the job and be able to tell, when the job is finished, whether or not it has made you a profit. The first column



JOB No.

Name — Charge to

Location — Where to collect

Workman — Ordered by

Nature of Work

Date Starting	MARK TIME STARTING AND FINISHING												Date Completing
	15-30-45 7	15-30-45 8	15-30-45 9	15-30-45 10	15-30-45 11	15-30-45 12	15-30-45 1	15-30-45 2	15-30-45 3	15-30-45 4	15-30-45 5	15-30-45 6	

QUANTITY			ITEMS	COST		SELL	
Taken	Ret.	Used		@	Amount	@	Amount

COST RECAP.	Cost on this Sheet	CONTRACT COST	Previous Cost Charged	Total Cost to Date	LABOR	Date	Hrs.	Hrs.	Hrs.	Hrs.	Hrs.	Hrs.
Material												
Labor												
Permits												
Inc. Exp.												
Overhead												
Truck												
Cash Discount												
Total Cost												
Sell'g Price		Amount to Complete Contract										
Cost		Amount of Contract										
Gain		Extra Work										
Loss		Total				Total Hours						

Original of Job Ticket. It Is Retained in Office While Workman on Job Takes Duplicate.

"Cost on this Sheet" is to be used for small jobs and for amounts covering the first *job ticket* on contracts that require more than one *job ticket*. The other two columns are for use on contracts that require more than one *job ticket*. The use of these columns begins with the second *job ticket* on the contract.

In the column "Previous Cost Charged" the figures from the first *job ticket* are carried forward, exactly as they appear on that ticket as to "Material," "Labor," etc. When the costs on this second ticket have been entered in the column "Cost on this Sheet" the figures opposite each item, beginning with "Material," in both columns, are added together and the total extended into the column "Total Cost to Date." By this means you are able to tell how much material, labor, overhead and other items have gone into your contracts up to any given point. The column "Total Cost to Date" will tell what the amount is up to the present *job ticket* and by adding to them the figures on that ticket you have the total right up to the minute.

The most important thing in this business is to know the cost of each job. Not only the total cost but the cost of each item; material, labor, overhead and other items. This *job ticket* provides spaces in which to keep these costs and to accumulate them as the job goes along.

It has been the practice of most contractors to enter all material sent out, in a day book showing to whom it was delivered. This pad of *job tickets* is your day book. It has a separate page for each job and space is provided in which to determine the result when the job is finished. These job tickets are to be wire-stitched together and numbered consecutively just like a bound book. There will be no dispute if it is necessary to go into court with them as evidence because there is no chance to add to or take from the original record without evidence of it.

In a following installment a job will be illustrated, fully worked on this Form. It would be an excellent

idea for every contractor to work out one of his own jobs on the illustration herewith in order to better acquaint himself with the advantages of this sheet.

The *job ticket* is the original entry on all sales transactions. It is the foundation of the accounting system. It must be so arranged that it will furnish the information desired when the books are closed at the end of the year or month. Unless this is done it is impossible to accomplish these result. An accounting system is just like any building; the foundation must be built to give proper results in the finished structure.

What Repair Man Needs to Know About the Automobile Radiator.

E. E. Zideck Explains What It Is, What It Does and How It Works.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by E. E. Zideck, Chicago.

LESSON 1.

THE student is requested to study each separate *statement of fact* as contained under a, b, c, d, and so on, *separately*. Each paragraph is to be memorized and immediately answered. Do not proceed to read the next paragraph, unless you can answer the questions asked in the first one. Turn over and over each statement and question in your mind. Ask yourself the questions in a changed form. Answer each in as many ways as you can think of. Only when you are perfectly sure of being able to answer any of the questions asked in the first paragraph *at any time* afterwards without having to turn back to the paragraph, are you to proceed to the next one and repeat the procedure.

(a) The radiator derives its name from *what it does;* from the name of the service it performs. Its function is to *radiate* into the air the heat produced by the *engine*. In other words, the radiator radiates, or *imparts, carries,* into the air heat produced by the engine working; hence its name, *radiator*.

Questions.

1. Why is a radiator called so?
2. From what verb does it take its name?
3. What does it mean to radiate?
4. What does a radiator do?
5. What service does it perform?
6. What is its function?
7. What does the radiator carry away from the engine?
8. What does it impart to the air?
9. Where is produced that which the radiator carries into the air?
10. By what is it produced and under what circumstance?

(b) The radiator *cools* the engine by carrying away from it the surplus heat it produces while working.

There are other kinds of radiators; those, for instance, which are employed in buildings to *heat* the rooms. Both kinds, however, *radiate heat into the air*. The kind we are concerned with radiate heat into the air, because it is not wanted in the engine which produces it. Hence, it *lessens* the heat quantity in the engine and keeps it sufficiently *cool* for operation. The other kind of radiators carry heat into the air contained in the rooms to make them *warm*.

Questions.

1. What kind of radiator are we concerned with here?
2. What does *our* kind of radiator do?
3. What other kinds are there?
4. What do they do?
5. Does *our* kind of radiator *heat* or *cool?*
6. What does it heat? What does it cool?
7. In what are both kinds alike?
8. What distinguishes *our* kind of radiator from the other kind?
9. Which radiator does the *heating?*
10. Which the *cooling?*

(c) The radiator with which we are concerned is employed in connection with *internal combustion engines* furnishing motive power to autombiles, trucks, tractors, aeroplanes and all other vehicles and contrivances propelled or *moved* by engines which, while working, produce too much heat for their satisfactory operation, and this excess heat must be carried away if they continue working.

Questions.

1. With *what* radiator are we concerned?
2. What does it do?
3. Where is it employed?
4. Why is it employed to do what it does?
5. In connection with what engines are radiators employed?
6. What do the engines do?
7. What part of that which an engine does is *undone* by the radiator?
8. Why is it necessary that a radiator undo a part of that which an engine does?
9. In what relation is an *engine* to an automobile and in what relation a radiator to an engine?
10. Do all automobiles have radiators?
11. If so, which? If not, why not?

(d) Over ninety per cent of all automobiles, trucks, tractors, aeroplanes and similar vehicles in use are propelled by *internal combustion* engines which are *cooled* by the *water circulation method.*

Engines have water jackets

around them with openings on top and bottom through which water passes between engine and radiator.

Questions.

1. Which *method* of cooling the engine of an automobile, truck, tractor or aeroplane is mostly adhered to?
2. Is there any water in the engine?
3. Is there any water in any part adherent to the engine?
4. How is that part called which, in an engine, contains water?
5. Does water enter the engine proper?
6. What does it enter when leaving engine?
7. How does water enter into any of the parts of the engine?
8. What does water do in or out of the engine?
9. Through what does water pass upon leaving engine?
10. Through what does it come to the engine?

(*Lesson 2 next week.*)

Novel Clock Gives Daily State of Business.

Included among twenty-five forms presented in a treatise on budgeting as a means of business control, issued by the Fabricated Production Department of the Chamber of Commerce of the United States, is a novel clock arrangement by which the small manufacturer can tell at a glance the daily state of his business.

Clocks, or dials, are devised for each of the principal activities of the business. Each clock has two hands, a red one, pointed at the budget allowance, which remains stationary for the entire month, and a black hand, which is daily set at the amount of money spent by each department. The dials can be arranged so that they can be conveniently contained in a flat box 2" deep, 24" wide and 50" long, designed for hanging on the wall.

The idea was conceived and put into operation by a manufacturer of optical goods, who found that his organization could be conveniently divided into the following five groups: Material, Factory, Administration, Sales and Advertising. The five executives at the head of these departments are placed into a business of their own and are told what the results of their next month's activities should be, together with the amount of money they may spend to produce these results. The Sales Manager is told how much in orders he is expected to get to keep the factory running; the Factory Superintendent, how much goods he must get out and how much accounts receivable he must create to provide the funds necessary in the following month; the Purchasing Agent, how much material is necessary to keep a well balanced inventory and to take care of the plans of the Sales Department; the Advertising Department and Administration, how much money they may spend in carrying out these plans.

How Many of These Men Can You Name?

Back in 1890—

The world's most famous automobile manufacturer was working in a bicycle shop.

A millionaire hotel owner was hopping bells.

America's steel king was stoking a blast furnace.

An international banker was firing a locomotive.

A President of the United States was running a printing press.

A great merchant was carrying a pack on his back.

Notes and Queries

Address of Superior Stove Works.

From H. F. Schoppe and Sons, Jefferson, Iowa.

Will you kindly inform me where the Superior Stove Works are located, as we desire to buy a long cross center for No. 87 Charm Laundry Stove from them.

Ans.—This concern was located in Chicago, but is now out of business. However, you can buy the long cross center for No. 87 Charm laundry stove from the Northwestern Stove Repair Company, 20 West Lake Street, Chicago, Illinois.

"Hummer" Warm Air Furnace.

From C. R. Oberholtzer, 509 West Maumee Street, Angola, Indiana.

I should like to know who manufactures the "Hummer" warm air furnace.

Ans.—R. J. Schwab and Sons Company, Milwaukee, Wisconsin.

"Packham" Stove Pipe Crimper.

From V. Flenniken and Company, Alexander City, Alabama.

Please advise us who makes the "Packham" stove pipe crimper.

Ans.—Packham Crimper Company, Mechanicsburg, Ohio.

Wet Bulb Thermometer.

From Blockie Furnace and Supply Company, 18 North Lee Street, Oklahoma City, Oklahoma.

Where can we purchase a wet bulb thermometer for use in testing humidity?

Ans.—Taylor Instrument Companies, Frisco Building, St. Louis, Missouri.

"National" Ranges.

From Fitzgerald Hardware, Madison, South Dakota.

Please inform us who makes the "National" ranges.

Ans.—Excelsior Stove and Manufacturing Company, Quincy, Illinois.

Address of Brantford Cutlery Company.

From Young Hardware Company, Bellevue, Iowa.

Can you give us the address of the Brantford Cutlery Company.

Ans.—Brantford, Pennsylvania.

Cement Coated Nails.

From Reckmeyer Hardware Company, Arlington, Nebraska.

Where can we buy cement coated nails for 3/8 inch flooring?

Ans.—Wilson Steel Products Company, West 49th Street and South Western Avenue, Chicago, Illinois.

"Pullman" Ventilator.

From Vertical Ventilator Company, El Paso, Illinois.

Please advise us where the "Pullman" ventilator is made.

Ans.—It is made at York, Pennsylvania, by the Pullman Ventilating and Manufacturing Company.

Address of E. Miller Company.

From L. T. Peterson, Court and Center Streets, Denison, Iowa.

Can you tell me where E. Miller Company, makers of lamp burners for hog waterers, are located?

Ans.—Meriden, Connecticut.

Summary of Tests by British Heating Engineers on Efficiency of Ranges Contains Much Useful Information.

Manufacturers as Well as Retailers of Kitchen Ranges Will Find Helpful Suggestions by Careful Study of This Summary.

(*This is the second of a series of articles on this subject.*)

THE efficiency observed in the experiments under series (1) was the ratio between the work done and the amount of heat in the fuel consumed. The fuel was burnt on an artificial system to secure as far as possible constant thermal conditions in the plant itself, the "work done" being also reckoned on a similarly arbitrary and artificial basis, e. g., the heat communicated to certain vessels of specified size under certain arbitrary conditions which were made to resemble as nearly as possible the actual conditions prevailing when the appliance is used in practice.

The efficiency of the hot-water supply was calculated as the ratio between the heat communicated to the water and that in the fuel consumed. All these were observed at several rates of fuel consumption.

In each case, the plant tested consisted of several different functions or parts of a range combined in one appliance. For the purposes of the test, it was necessary to assume that each such function was a separate appliance. It was assumed, for instance, that during the hot-water supply tests the range was required for no other purpose than that of hot-water supply. All the heat escaping into the other parts of the apparatus was regarded as lost for the purpose of this experiment.

Similar observations were made in respect of each separate function. The total gross efficiency of the entire plant was taken to be the sum of the separate efficiencies taken when the appliance was used in one particular manner corresponding as nearly as possible to practical conditions.

Description of Plant Used.—The experimental plant is described in detail in the report, accompanied by diagrams. Each range was so erected that any rate of draught could be exactly maintained by artificial means. Instruments were designed and constructed for observing the various quantities dealt with, such as the quantity of coal burnt and ashes produced, the intensity of the draught, the quantity of flue gas, the chemical analysis of the same, the quantity of hot water produced, the "temperature" or rate of transmission to vessels placed in the oven, the heat communicated to the separate hot water supply, and to vessels placed on the hot plate, and the like.

Each delivery of fuel was tested in the calorimeter.

Subsidiary Investigation.—It was necessary, in order to obtain a sound basis for the experimental results, to make preliminary investigations of certain highly technical questions bearing on the efficiency. For instance, what difference in effect is produced when the same rate of combustion is maintained at different rates of draught, and corresponding differences in thickness of fire and quality of fuel. These and similar questions were investigated both in regard to the oven transmission and to the hot water supply.

Correctness of Observations.—Questions of correctness of the observations owing to ancillary losses were also the subject of investigation.

Oven Temperature.—An important question was also investigated of the extent to which the oven temperature as observed by a thermometer as thermo-junction is a measure of the rate of heat transmission to a vessel placed in the oven. There was found to be very small correspondence between these two functions. The oven temperature is shown to be a function of very uncertain significance.

Differences of Oven Temperature.—An important and very difficult practical question also arose in relation to the difference of apparent temperature in the upper and lower parts of the oven due to radiant heat.

Apparatus of Different Size.—One difficult question having an important bearing on the result was how to deal with apparatus having ovens of different size. After considerable investigation it was found that in two apparatus of the same design but of different size, the consumption of fuel for equal effect varied in proportion to the surface area of the flues surrounding the oven on the one hand, and the surface area of the hot plate and the surface of the hot-water supply boiler on the other, and that two such appliances could be reduced to a common denominator by estimating the fuel consumption per square foot of such surfaces. This was done in all cases. It introduces great complication of calculation.

It was shown by experiment that the rate of heat transmission to vessels of different size placed in the same oven varied as the superficial area of such vessel for small surfaces only; in other words, that both the consumption and the transmission varies as the square of any one linear dimension. For larger vessel surfaces the rate of transmission per square foot of surface decreases as the surface of the vessel increases. This question was investigated experimentally.

Open and Closed Fires.—A series of experiments was made in order to determine the relative economy of open ranges of the type known as "Yorkshire" and closed ranges of the ordinary type.

The extravagance of the Yorkshire type is obviously due to the great excess of air inevitably used

for combustion in an appliance of this type.

Excess of Air.—Extended investigations were made of the degree to which losses were caused by this excessive aeration of the products of combustion. This was proved to be the principal cause of loss in a range. It arises through leakage into the furnace chamber and flues of cold air from the kitchen. The more perfectly this leakage can be prevented the greater is the economy. Apparatus were tested in their original form, and were so altered as to reduce the excess of air employed, and the differences in consumption noted. Prevention of leakage of cold air has a most important effect on the draught induced by the chimney.

A condition of air tightness was shown to be inconsistent with some of the facilities usually demanded by the cook, such, for instance, as the ability to toast bread at the front of the range.

It was proved that one condition of maximum economy is that the fire should be so completely enclosed that the air can not obtain access to the furnace or chamber flues otherwise than through the incandescent fuel. The thickness of the fuel should be adequate to carbonize as much as possible of the air used for combustion. The composition of the flue gases is a reliable criterion of this effect.

In no case of an ordinary range did the analysis of the flue gases, which was made continuously throughout all the later tests, show more than 2 per cent of CO_2, indicating that at least six to ten times as much air for combustion as is necessary is commonly used.

The most economical results in general boiler practice are secured when the proportion of CO_2 in the flue gases is about 12 per cent, but no figure even approximating to this value was ever obtained throughout the whole experiments. Those ranges in which the fire is totally enclosed in some cases rose as high as 7 per cent, and showed a correspondingly high efficiency.

Influence of one Part of the Range on Another.—It was found that in two ranges of similar general construction, as the efficiency of the hot water supply and of the hot plate rises, that of the oven decreases almost in proportion, the total efficiency of the appliance considered as a whole being roughly constant for apparatus of the same general construction. This proves the great influence which the hot-water supply portion of the plant has on the efficiency of the oven.

In order to investigate this matter two of the appliances were tested in the following way: Continuous observations were taken for several weeks of the apparatus provided with the usual back boiler. The latter was then removed and replaced by fire-brick blocks, and the same appliance then tested without the boiler. It was found in both cases that the total consumption was reduced by from 50 per cent to 66 per cent when the boiler was removed. This proved that the presence of a boiler in the range is a very extravagant feature considered in relation to the use of the apparatus as an oven. On calculating the total efficiencies by adding together the individual ones taken in one arbitrary condition, it was found that there was a surprising measure of uniformity between most of the ranges of the same general type. Some few of them of unusual type were widely different from the bulk, but in the main it may be said that the ordinary efficiency of such an appliance when all the functions are in use simultaneously for cooking purposes, with the oven regarded as the principal function, is in the neighborhood of 7 per cent.

Position of Oven.—An investigation was made of the relative advantages and disadvantages of different positions of the oven in regard to the fire. It was found that in all cases those ovens which were placed immediately over the fire so that the fire played on the bottom of the oven before reaching the top were very much more efficient in direct transmission than in the opposite case. But it must not be lost sight of that, for many oven purposes, the effect of what is called "top heat" is very different from that of "bottom heat." In some cases "top heat" is necessary to produce crisp baking effects and the like. Also the arrangement of the fire below the oven hinders its effective use for hot plate and boiling purposes, and the simultaneous cooking in the same oven of articles requiring widely different treatment, e. g., baking bread and milk puddings.

This difference again raises the question of the operation of radiated and convected heat in the interior of an oven, a scientific question of great difficulty.

The result of the practical investigation shows that "top heat" is much more expensive in fuel than is "bottom heat," and this cost is rendered all the greater by the common practice of using the top part of the flue above the top of the oven as a hot plate, thereby producing heavy cooling effects.

Effect of Hot Plate.—This matter was also investigated by clothing the hot plate in several of the appliances with a heavy asbestos mattress, which to a large extent diminished the heat loss from the hot plate. The effect on the oven economy was most marked.

This device alone decreased the fuel consumption for a given effect by some 35 per cent, varying at different rates of combustion to some 20 per cent.

Extravagance of Combination of Functions.—The general conclusions arrived at are that the combination of several different functions in one range renders each such function excessively extravagant when considered alone. The combination is only relatively economical when all the functions are in use simultaneously. Even in that case existing designs can not be called really economical, because of the circumstances that the consideration kept in view in making such designs has been the convenience, compactness and cheapness of the whole device, and not the conditions which would lead to a maximum of economy, which latter are in many or most

cases inconsistent with the foregoing.

Further it is open to question to what extent all the parts of a cooking appliance are actually required simultaneously in ordinary practice. It is only rarely that this combination is required in a small house. No doubt during the preparation of a big dinner of several courses all parts of the plant might be required simultaneously, but generally in a small household only one part of the appliance is wanted at one time.

For instance, in a working man's house at breakfast time the hot plate is the only part of the appliance needed. All the operations necessary for the preparation of a working man's breakfast can be easily conducted on the hot plate only. If, therefore, the apparatus is such that the hot plate can not be heated without simultaneously heating the oven and the hot water supply it necessarily involves great extravagance in fuel.

Similarly, it may be that in a working class family the children receive only a weekly bath, and that for the purposes of saving fuel they are all bathed on one particular night, generally Saturday night. On that occasion the hot water supply portion of the plant only is needed, and any heating of the oven and hot plate is unnecessary, and even in summer very undesirable. A separate hot water supply apparatus of simple charaacter uses only one quarter of the fuel required by a range boiler. Several of these have been tested.

Thus, in the interests of economy, each portion of the plant should be designed for maximum economy separately. Whether or not this condition may be secured with only one fire is one of the principal practical questions raised by this investigation. The disadvantages—amounting to impossibility in many cases—of supplying more than one fire for a very small apparatus is, of course, recognized.

The diagrams and tables accompanying this report give generally the results of all the experiments made, each graph representing results of about three or more weeks' experiment on the one apparatus. The varying shape of the graphs in some cases is noteworthy, and is fully discussed and explained in the report.

Physical Tests.

Individual Efficiencies.—Of all the ranges tested the lowest efficiency recorded in oven transmission was 1 per cent, that is to say, that the ratio between the amount of heat communicated to the standard vessel in the oven and that in the coal consumed was in this proportion. The highest such efficiency was 5 per cent, except in specially designed appliances in which it rose to 17 per cent, the average of all commercial ranges being about 2½ per cent.

Hot Water Supply.—In all the apparatus submitted the lowest efficiency of the hot water supply portion of the plant was 8 per cent, while the highest was 18 per cent to 20 per cent. The latter figure was only reached in one case. The great majority of the ranges tested have an efficiency of 11 per cent to 12 per cent. Special ranges designed by ourselves reached 45 per cent.

Hot Plate.—The efficiency of the hot plate varied between 1 per cent and 5 per cent. Twelve to 20 per cent can easily be secured in specially designed appliances.

Total Efficiencies.—Considering the apparatus as a whole the total amount of heat usefully employed when all the apparatus was in use together for cooking purposes was calculated in each case against the total heat in the fuel consumed. These efficiencies in all cases varied with the consumption. Generally it was found that the higher the consumption the greater was the efficiency, a somewhat surprising fact.

The lowest efficiency was about 5 per cent, the highest about 11 per cent, and the great majority about 7 per cent. Thirty per cent was easily obtained in apparatus of special design.

Practical Tests.

These tests were designed with the object of investigating the economy of the various appliances as they would be used in practice in the cottage of a working-class occupant. A standard menu was drawn up in consultation with a committee of experts, consisting of Dr. Janet Lane-Claypot, Mr. Herman Senn, and Mr. M. T. E. Jackson.

This standard menu was designed to test the capacity of the appliance for stewing, baking, casserole cookery, and light cooking, also for supplying definite quantities of hot water at definite times of the day. The standard menu was carried out on each of the ranges tested, and comparison made between the fuel required in each case.

It was found in all cases that the result of the physical tests described above was a very sound guide to the economy of the appliance in practice. A carefully detailed report on the performance of each range was drawn up at the conclusion of the experiments, based on the practical convenience, durability, rapidity, and economy of the appliance as appearing to the experimenters after a test, which in one case, extended over about three weeks.

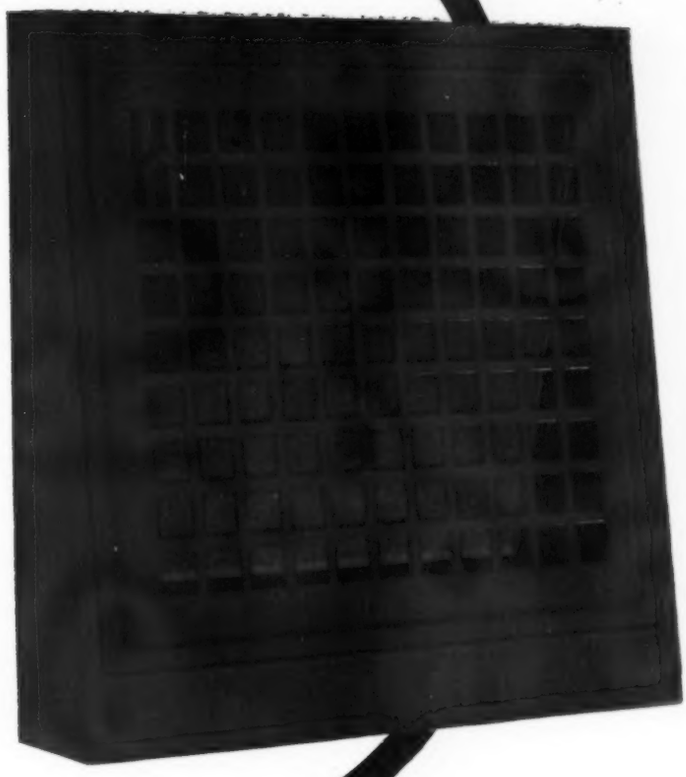
Though it is possible that some of these criticisms may be to some extent matters of opinion, they were drawn up after very careful consideration being given to the matter by the members of the Committee, whose opinion was in all important matters unanimous.

(This article will appear in three sections. The next division will appear in an early number.)

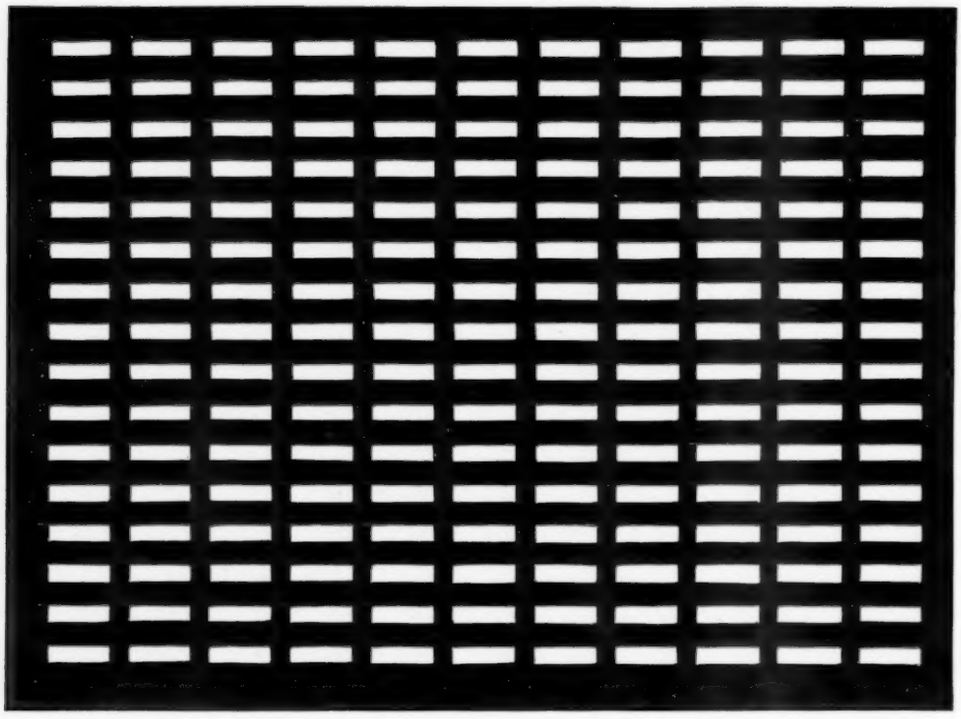
High Class Salesman Wants Gas Line for East.

A stove salesman of exceptionally high efficiency, with established trade, is looking for a line of gas ranges for New York, New England and New Jersey.

AMERICAN ARTISAN will be glad to forward any letters from manufacturer of gas ranges to this man who will handle the line on a commission basis.



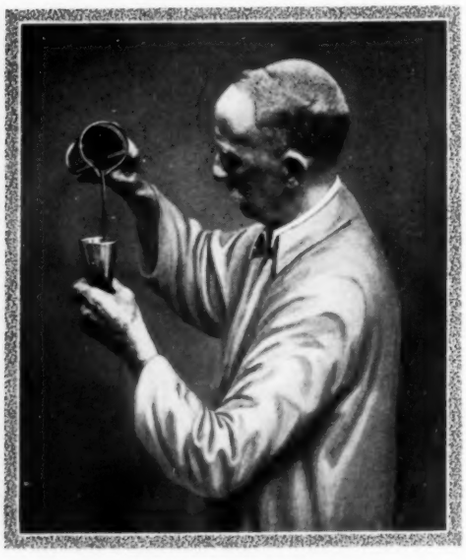
Found 25 Years After



This Tanbo oak finish is just the thing for cold air register faces. We can make them in any wood effect you want.

Tanbo Finish

A Great Discovery That Means Much To You



Old Man Williams at work in his laboratory. He it was who made the final vital discovery that gives to the Tanbo Finish such an attractive effect and makes it *stand such a power of wear and tear.*

ONE snowy, blowy night over a quarter of a century ago, three of us were having our supper at Beef Steak John's. We had asked old Karl Tanbo to join us. No sooner had we sat down than he came in, stamping the snow off his feet and unwinding an old red knit muffler, that he always wore.

Karl was a chemist. One of those shaggy-eyebrowed men who peer at you through little old fashioned silver rim spectacles. He had been working for several months, trying to

get a finish for our registers, that would be better than electro-plating. A finish that would stand wear and tear.
He had the finish all right, that very night. A beautiful rich brass and bronze that fairly made our eyes bulge out, it looked so good.

All of us went home feeling as if the world was ours.
But it wasn't! Nor was the finish! Leastwise it was ours, but good as it looked, it wouldn't stand the wear. Karl died shortly after. Ever since then our chemists and finish experts have been experimenting, trying to find the answer.

One day about a year ago my telephone rang excitedly and the minute I put the receiver to my ear, someone fairly shouted: "We've got it. We've got it! Got it at last!" "Got what," said I, "the measles or the mumps?" "No, the long sought finish. A brass, bronze, oxidized copper and natural wood effect finish, that I'll stake my life on, will stand wear better than the plated ones."

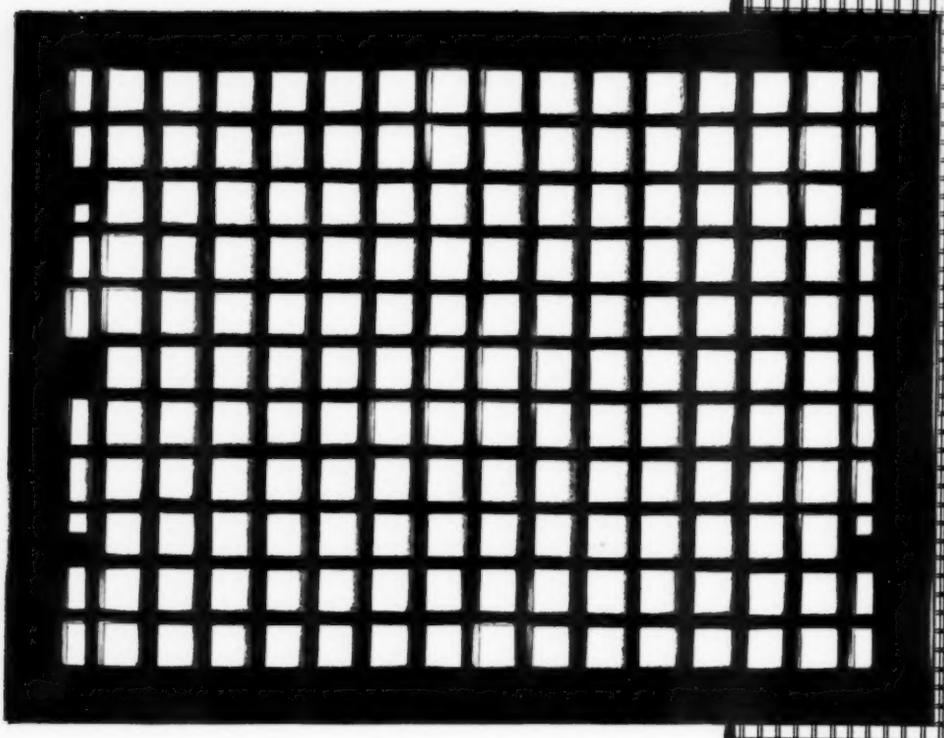
It was old man Williams talking. He, who is the head of our finishing department. Sure enough he had at last solved the problem we had all been working on for a quarter of a century.
Like most discoveries, he ran into it while experimenting for something entirely different.
After giving it all kinds of severe wear and tear tests, it has stood up under every one better than the electro-plating.

Of course, we promptly called it The Tanbo Finish in memory of old Karl Tanbo who first had the idea. After you have seen Tanbo you will never want any other, that's sure.
It's just one more of the many superior points about our registers, *that no other registers have.*
Send at once for further particulars about this new patent protected name and finish.

Tanbo Brass.

Tanbo Oak.

Tanbo Oxidized Copper.



Tanbo Oxidized Copper finish is quite the most wonderful of all.
The way Old Man Williams worked out how to do it, is nothing short of wizard like. Still now it's done, it seems as simple as slipping on ice.

TUTTLE & BAILEY MFG CO.

Established 1846

36 Portland St.	2 W. 45th St.	1123-29 W. 37th St.
Boston	New York	Chicago

Events and Progress of the Hardware Trade.

What the Retailers, Jobbers and Manufacturers Are Doing. Latest Selling Methods and Experiences of Successful Men.

Santa's Mail Box in Merchant's Store.

Every December the R. G. Heslop & Sons furniture store of Martin's Ferry, Ohio, open a Santa Claus postoffice for the boys and girls of this city. The store advertises that if the youngsters will leave their letters at the store Santa will pick them up when he stops there on Christmas Eve.

On the eve before Christmas a drawing of the letters is held, and the writers of the fifth and tenth letters are given a prize of a toy of some sort. Most of the children bring their letters down to the store and this usually attracts large numbers of parents to look at the store's assortment of toys and gifts.

The store manages to attract older persons by offering prizes to those who can guess which type of merchandise will sell best during the holiday season. On the face of it, this would seem to be an easy stunt. Last year many of the contestants predicted toys, phonographs and records, but as a matter of fact the store sold more rocking chairs than it did anything else.

Here Are Christmas Selling Suggestions Which Lead Campaign Forward as Holiday Spirit Grows

Newspaper Advertising, Window Displays, Special Selling Devices Should Be Part of One Plan.

NOW that Thanksgiving is over, the alert merchant is centering his efforts on Christmas.

In aggressively launching the campaign, the merchant will do well first to canvass his stock, for it is imperative that the whole stock, as figured by the merchant, should be in the store when the campaign starts so that there will be no delay in showing the lines.

The Christmas campaign is not to be attempted in a happy-go-lucky sort of way. The probable selling worth of each line should be carefully weighed; the amount of advertising, the window displays and their designs, the various ways to excite the curiosity of the public and to bring them into the store, should be gone over carefully.

The foregoing Christmas merchandising suggestions are made in a special article by Victor Lauriston in the annual November special edition of the *Michigan Tradesman*. This number, celebrating the fortieth year of existence of this influential publication, contains many meritorious trade articles, and we quote from Mr. Lauriston's article as an example:

The clerks should be consulted. One or two pleasant evenings could be spent by the merchant and his staff discussing ways and means. It would be time well spent, for it all depends upon the handling of the stock how the Christmas trade is going to swing.

It must not be forgotten that the Christmas demand can be stimulated much more easily than a from-day-to-day demand for an ordinary article. The demand is there, and the merchant has not so much to create it as to swing it in his direction.

The custom of giving useful presents is developing of itself every year. What the hardware dealer has to do is to prove that he is the best medium for the buying of presents. This can be done only by a strong campaign of publicity.

Excite the curiosity and interest of the public, show what you have in the line of useful gifts, display novelties that will set the people talking, and the battle is half won.

All this, however, means hard work and careful preliminary planning. Therefore the merchant who has his whole extra Christmas stock in his store, who has carefully picked out from his staple lines such articles as will make useful presents (and it is surprising how many of these there are) and arranged them in his mind's eye already for the fight, is in the best shape to secure business.

In connection with the Christmas trade, the merchant must remember that it is necessary to do a little extra advertising and to devote some extra attention to window display. Not only must the windows be decorated, but the interior must have a Christmassy appearance. The store must radiate the spirit of the times: a feeling of good cheer must predominate in all directions. Then, again, as a large percentage of the Christmas trade pertains to children, children must be specially catered to. Therefore the hardware dealer should see that, whatever decorations or displays he puts on, are calculated to some extent at least to attract the attention of the youngsters.

Keep the window trims changing twice a week if possible until about December 15, when the real Christmas window should be put in. After that, there will be little time to do anything except sell and deliver goods. Hence it is essential that the window trims and the advertising copy be planned well ahead of time, and in such shape that the results can be put before the public with the minimum of effort when the real rush sets in.

Put Santa Claus to work early in the game. One hardware dealer used a real live Santa Claus in his store window from December 4 to

December 24. Santa's arrival on December 4 was announced in advance, and he was greeted by all the young and most of the old people on his way from the depot to the store.

The display was made up of a large old-fashioned mantel-piece over which three deer heads were mounted, while in the background an artist painted a representation of Santa Claus coming down from the clouds in his sleigh.

The window and the live Santa Claus were great drawing cards. There were several occasions when Santa Claus took his sleigh and went to the neighboring schools and brought the children to the store and took them back home without charge. This was a great event for the little tots, many of whom had never been away from home, and all trusted implicitly in Santa Claus. Santa also brought the youngsters from the local Children's Shelter to the store for a visit. On Christmas Eve he visited the hospital with a toy for each nurse and each patient. They had a great time with him and as the matron put it, they "just cut loose and had a regular frolic." The resulting holiday trade was exceptionally good.

Good use can be made of direct-by-mail advertising in the way of bringing out early buyers. Almost every hardware dealer has his mailing list of regular customers and good prospects; and many of them circularize these lists from month to month. Toward the end of November it is a good policy to go over this list, making such additions as may seem desirable, and send out a circular letter discussing Christmas buying—with emphasis on the desirability of buying early and avoiding the rush.

This letter should be accompanied by a list of suggested gifts. Many hardware dealers now have lists of this sort printed or mimeographed for distribution to customers. The articles can be listed, either according to price, or according to recipient—that is, for father, for mother, for sister, for brother, for boys, for girls, for baby. Anything that helps the puzzled gift-seeker to make an intelligent selection will be appreciated.

Does the Jeweler Offer "Gifts of Utility"? No!

E. G. Aubrey, field secretary for the Illinois Retail Hardware Association and editor of its official publication—The Illinois Hardware—hits the nail squarely on the head in telling hardware merchants to go after Christmas business. Can you blame the uninstructed buyer, he asks:

In going to the jewelry store, the department store, the music store, the electric shop, the drug store, the stationery store, the book store or the furniture store to find GIFTS OF UTILITY? Of course not! But it's not his fault, because the retail hardware merchant does not advertise the fact that he carries the best assortment of useful gifts in his community.

The jewelers have been advertising "lay-away" gifts for the past two months, and the florists are continually selling us on "Say It With Flowers," but the hardwaremen are as silent as the Sphinx in Egypt on the fact that the average hardware establishment is as full of useful things as the average house dog is as full of fleas.

"I'll tell the world" would be a good slogan for the hardware men. It's a wonder to me that some of them make any money, they are so modest about advertising their wares and their services.

How to Get Snowy Effects in Christmas Window.

Christmas is a time when all sorts of attractive displays can be installed. Christmas and snow are always associated together so it naturally follows that it would be well to associate them together in the window trims about that time of the year. A very Christmassy window display can be obtained with very little expense. The floor of the window can be covered with cotton and imitation snow sprinkled over it to give it that sparkle and glisten that real snow gives.

Then instead of the valance that many hardware stores use at the top of their window they can use cotton batting cut to resemble icicles.

Bits of cotton can be pasted on the window to give the appearance of snow and the effect will be complete.

The goods that the dealer wants to display can be grouped around in the window on the cotton. A window trim of this kind will carry the atmosphere of Christmas.

Stores Gives Christmas Treat to Orphans.

Wolf & Dessauer, Fort Wayne, Indiana, merchants, have in their beautiful store a huge auditorium where entertainments are frequently given. Last year the orphans of a nearby institution were entertained royally and Santa Claus presented each with a souvenir. People of the city were urged to contribute clothing, etc., to be presented to them. Of course all the little boys and girls were invited.

On the first floor, a registration book was stationed and each child was asked to give his name, address and the one thing he wanted most for Christmas. This provided an excellent mailing list for the children's department, and in order that no child would be disappointed Santa presented an inexpensive gift.

Interest Women in Your Store and Sales Will Jump.

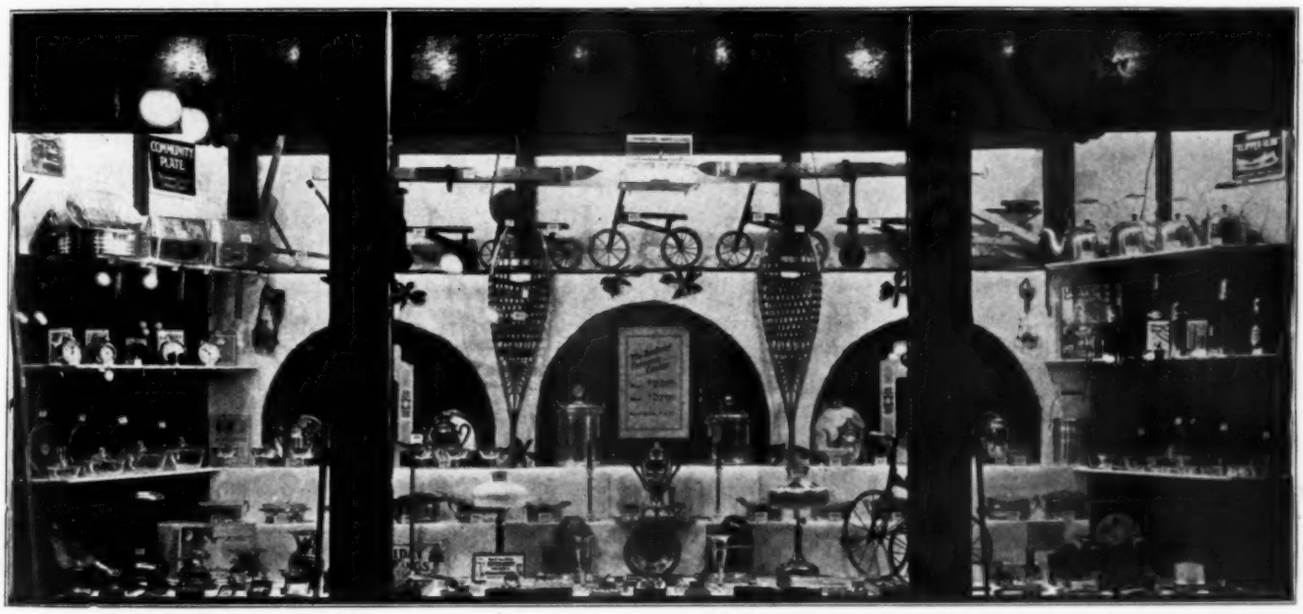
Women's interests should have a distinct representation in the window display. The window generally should be more humanized. Stores should be made more attractive. Household utensils may be artistically arranged, and a good section, well displayed in the show cases, will always attract the woman customer. Comfort should go with each sale and purchase. The provision of seats is an important factor. Courtesy is most important of all. The clerk must be eager to answer questions, however many.

Suggestions and Plans for Window Displays.

Instructive Examples from Exhibits in AMERICAN ARTISAN AND HARDWARE RECORD Window Display Competition.

Here's Way to Crowd Your Christmas Window.

The problem of getting the largest number of articles in the Christmas window without making it appear a hodge podge is an old problem that annually confronts the window designer. Harold Stevens, who designed the window shown here for the Wilson Hardware Company of Boulder, Colorado, has found a real solution in the use of a white background. Note how the articles stand out as though in silhouette.



Splendid Christmas Window Display Designed by Harold Stevens for the Wilson Hardware Company, Boulder, Colorado.

The application of this background, together with the unique shelving device, makes this window one of exceptional merit. Variations of this application will suggest themselves, and the following description of the window should be read and studied thoroughly:

"The window is 27 feet long and 6 feet deep and before being trimmed the sides, back and ceiling were dark stained in paneled wood. I covered the back and sides up to a height of 6 feet with bright red crepe paper.

"Two rows of shell boxes (the back row two deep) support the step shelves at the back of the window. An 18-inch space was left at the back to allow easy access to any part of the window.

"The side shelves and the top back shelves are covered on both sides with glazed white paper. I then filled in every panel on the top and upper part of the window with white paper and covered the floor with the same. The arches are cut out of sign-writers' cloth, tacked to the top back shelf and to the middle of the shelf below.

"Green Christmas cord and electric Christmas tree festoons are stitched around the edges of the arches and up the upright in the front of the window.

"Light frame panels covered with decorative red holiday paper are hung by screw eyes along the front top of the window, shading the glare of the electric lights from the eyes and giving a soft red lighting effect. These panels I use right along, covering them with crepe paper to match the color scheme of the window. Goods were placed as follows:

"The center floor of the window displays, carving sets and silverware; the left floor, razors, shaving sets, cuspidors, electric heaters and foot warmers; the right floor, manicure and scissors sets, crumb and nut sets and Jap baskets.

"The rest of the merchandise shows up in the photo, with the exception of razor strops on the front uprights and the Rochester Percolator display stands in the two side arches at the back.

"Being the shopping season of the year, in order to display as much a variety as possible, the window may appear a little crowded (the photo gives this idea more than was actually the case), but I have tried to overcome that effect by the use of the white paper and by getting a good balance to the trim.

"Every article was plainly priced and I need hardly add that both merchandise and glass was scrupulously clean."

Think of the past only in applying it to the solution of present problems. If you keep continually living in the past you will never be a success when the future changes into the present.

1923 Window Display Contest to Bring Out Record Number of Meritorious Designs.

American Artisan Seeks by Competition to Bring Out Best Ideas in Window Merchandising.

IN A current number of one of the most frequently quoted business magazines appears an article with this caption: "Advertisements—the Windows of Business."

In another publication of current date appears this suggestion to merchants: "Consider your store window as an expensive newspaper advertisement in a newspaper in which the circulation is the number of people who pass in front of your window."

Here, then, is the same idea, conversely stated. The advertisement is the window of business, the window is the advertisement of business.

It is this so important and fundamental merchandising principle that AMERICAN ARTISAN AND HARDWARE RECORD has so long and energetically stressed to its merchant readers.

Time was, and not so very far back, when the druggist like the antiquated apothecary, used his windows to show the globes of colored water to acquaint the world with the nature of his business. The electric sign has supplanted that, and the window has taken its proper place—a place to display goods.

In announcing its 1923 annual window display contest, AMERICAN ARTISAN AND HARDWARE RECORD again undertakes to stimulate that competition calculated to bring out the best in creative effort in winodw merchandising. But that is not all. The contest would never approach its more ambitious efforts nor achieve its more successful ends, if it were to be limited there. The more important thing is that the ideas are to be exchanged and distributed among all through the medium of AMERICAN ARTISAN.

Thus the reproduction of the more distinctive displays in this publication, with their strong and weak points noted, permits all to share in the work of constructive criticism, and allows further the craftsman to build from where his fellow craftsman left off.

Former contests of this nature conducted by this magazine have always brought out the best window display work of clerks and dealers.

Last year the number of entries broke all records and there are indications this year's contest will set a new mark. Here are the main rules of the contest:

It costs nothing to enter, and you may enter as many entries as you want to.

The window display must be photographed, and the display may be made up of goods from any of the following lines: General hardware, machinists' supplies, builders' hardware, automobile supplies, sporting goods, fishing tackle, house furnishings and paints, cutlery, dairy supplies, stoves, ranges, warm air heaters, sheet metal or kindred lines.

The photograph, together with description of how the window display was arranged and the materials used, may be sent by mail or express, charges prepaid, and must reach this office *not later than April 1, 1923.*

Each photograph and description must be signed by a fictitious name or device and the same name or device must be placed within a sealed envelope containing the real name and address of the contestant, this sealed envelope to be enclosed with the photograph.

AMERICAN ARTISAN AND HARDWARE RECORD reserves the right to publish all photographs and descriptions submitted in the contest.

Four prizes, totaling $100, are to be awarded for the entries adjudged the most meritorious. These are; first prize, $50; second prize, $25; third prize, $15 and fourth prize, $10.

A competent committee of three will pass on the designs. One of the committee will be an expert window dresser and one an experienced hardware man.

How Salesmen Should NOT Approach Customers.

Among the characteristics of successful salespeople, diplomacy in the handling of customers ranks high. It is an important thing involving more than the individual sale. A satisfied customer builds up store good will, a dissatisfied customer tears it down.

A writer in *Doorways,* the monthly house publication of Richards-Wilcox, well known manufacturers of fine builders' hardware, of Aurora, Illinois, makes observations similar to these in the current issue. He adds:

Two condemnable policies seem to exist among salespeople in handling such a situation.

There is the salesman who "sizes up" the waiting crowd and shows a tendency to "pick" his next customer. This practice is, of course, displeasing, and generally causes irritation on the part of the one passed by. But if you are "picked," the result is even worse, because of the embarrassment of your knowing that another standing by is rightfully ahead of you. This policy is all wrong and should not be followed.

Another method commonly used is to attend the customer in hand without even seeing the waiting customer until his turn comes.

This method is not as bad as the other, savoring more of omission than commission. But if you will analyze your feelings the next time you, as a customer, are treated this way, you will find a feeling of resentment creeping over you, that will make salesmanship doubly hard for the salesman when he finally gets to you.

Of course, a salesman should not rush up and shake each new arrival by the hand as he enters the store, but when the waiting customer comes within easy range of his

vision he should at least get a nod or "Good morning, I will be with you shortly."

Such a salutation immediately ties the salesman up to him, for it affords a tangible acknowledgment of his presence and really a tentative service which will be found to serve as an easy entering wedge later, and also help to tide over the waiting interval.

Furthermore, it has a decided tendency to speed up the customer in hand, without in any way irritating him; while the touch of impatience which the entering customer felt on finding he would have to wait, leaves him immediately and at the same time establishes a basis for pleasant salesmanship and future relations.

A smile of recognition and a few words of welcome to the newcomer in your store as the salesperson waits on the customer in hand will prolong his patience and create a friendly feeling between the store and the new customer—and may be the means of definite promotion for the salesperson!

Coming Conventions

Western Implement and Hardware Association, Kansas City, Missouri, January 16, 17, 18 and 19, 1923. Exhibition in Convention Hall. H. J. Hodge, Secretary, Abilene, Kansas.

Texas Hardware and Implement Association, Dallas, Texas, January 23, 24 and 25, 1923. A. M. Cox, Secretary, 822 Dallas County Bank Building, Dallas, Texas.

Mountain States Hardware and Implement Association, Denver, Colorado, January 23, 24 and 25, 1923. W. W. McCallister, Secretary-Treasurer, Boulder, Colorado.

Kentucky Hardware and Implement Association and Exhibition, Jefferson County Armory, Louisville, Kentucky, January 23, 24, 25 and 26, 1923. J. M. Stone, Secretary, Sturgis, Kentucky.

West Virginia Hardware Association Convention and Exhibition, Huntington, West Virginia, January 30 and 31, and February 1, 1923. James B. Carson, Secretary, 1001 Schwind Building, Dayton, Ohio.

South Dakota Retail Hardware Association, Sioux Falls, South Dakota, January 16, 17, 18 and 19, 1923. H. O. Roberts, Secretary, 1120 Metropolitan Life Building, Minneapolis, Minnesota.

Idaho Retail Hardware and Implement Dealers' Association, Boise, Idaho, January 31, February 1 and 2, 1923. E. E. Lucas, Secretary, Hutton Building, Spokane, Washington.

Indiana Retail Hardware Association Convention and Exhibition, Indianapolis, Indiana, January 30 and February 1 and 2, 1923. G. F. Sheely, Secretary, Argos, Indiana.

Oklahoma Hardware and Implement Association, The Auditorium, Oklahoma City, Oklahoma, January 31, February 1, 1923. W. A. Clark, Secretary-Treasurer, 209½ West Main Street, Oklahoma City, Oklahoma.

Nebraska Retail Hardware Association, Convention and Exhibition, February 6 to 9, 1923, Omaha, George H. Dietz, Secretary-Treasurer, 414 Little Building, Lincoln, Nebraska.

Michigan Retail Hardware Convention and Exhibition, Grand Rapids, February 6, 7, 8, 9, 1923. Karl S. Judson, Exhibit Manager, 248 Morris Avenue, Grand Rapids. A. J. Scott, Secretary, Marine City, Michigan.

Virginia Retail Hardware Association, Norfolk, Virginia, February 7, 8 and 9, 1923. Thomas B. Howell, Secretary, Richmond, Virginia.

Wisconsin Retail Hardware Association, Milwaukee Auditorium, Milwaukee, Wisconsin, February 7, 8 and 9, 1923. P. J. Jacobs, Secretary, Stevens Point, Wisconsin. George W. Kornley, Manager of Exhibits, 1476 Green Bay Avenue, Milwaukee, Wisconsin.

Pennsylvania and Atlantic Seaboard Hardware Association Convention and Exhibition, Philadelphia Commercial Museum, Philadelphia, Pennsylvania, February 12, 13, 14, 15 and 16, 1923. Sharon E. Jones, Secretary, 1314 Fulton Building, Pittsburgh, Pennsylvania.

Ohio Hardware Association Convention and Exhibition, Cleveland, Ohio, February 13, 14, 15 and 16, 1923. Exhibition in the new Municipal Hall. James B. Carson, Secretary, 1001 Schwind Building, Dayton, Ohio.

Illinois Retail Hardware Association Convention and Exhibition, Hotel Sherman, Chicago, Illinois, February 13, 14 and 15, 1923. L. D. Nish, Secretary-Treasurer, Elgin, Illinois.

Iowa Retail Hardware Association Convention and Exhibition, Des Moines, Iowa, February 13, 14, 15 and 16, 1923. A. R. Sale, Secretary, Mason City, Iowa.

North Dakota Retail Hardware Association, Grand Forks, North Dakota, February 14, 15 and 16, 1923. C. N. Barnes, Secretary, Grand Forks, North Dakota.

Missouri Retail Hardware Association Convention and Exhibition, Planters Hotel, St. Louis, Missouri, February 20, 21 and 22, 1923. F. X. Becherer, Secretary, 5106 North Broadway, St. Louis, Missouri.

Minnesota Retail Hardware Association, Duluth, Minnesota, February 20, 21, 22 and 23, 1923. H. O. Roberts, Secretary, 1120 Metropolitan Life Building, Minneapolis, Minnesota.

New England Hardware Dealers' Association Convention and Exhibition, Mechanics' Building, Boston, Massachusetts, February 21, 22 and 23, 1923 George A. Fiel, Secretary, 10 High Street, Boston, Massachusetts.

New York State Retail Hardware Association Convention and Exposition, Rochester, New York, February 20, 21, 22 and 23, 1923. Headquarters, Powers Hotel. Sessions and Exposition at Exposition Park. John B. Foley, Secretary, City Bank Building, Syracuse, New York

Indiana Sheet Metal Contractors' Association, Terre Haute, Indiana, February 21 and 22, 1923. Leslie Beach, Secretary, Richmond, Indiana.

Michigan Sheet Metal and Roofing Contractors' Association, Bay City, February 26, 27, 28 and March 1, 1923. Frank E. Ederle, Secretary. 1121 Franklin Street, S. E., Grand Rapids, Michigan.

American Hardware Manufacturers' Association, Spring Convention, Windsor Hotel, Jacksonville, Florida, April 24, 25, 26 and 27, 1923. Frederick D. Mitchell, Secretary - Treasurer, 1819 Broadway, New York City.

Southern Hardware Jobbers' Association, Windsor Hotel, Jacksonville, Florida, April 24, 25, 26 and 27, 1922. John Donnan, Secretary-Treasurer, Richmond, Virginia.

Old Guard Southern Hardware Salesmen's Association, Windsor Hotel, Jacksonville, Florida, April 25, 1923. R. P. Boyd, Secretary-Treasurer, R. F. D. 4, Knoxville, Tennessee.

Hardware Association of the Carolinas, Columbia, South Carolina, May 8, 9, 10 and 11, 1923. T. W. Dixon, Secretary-Treasurer, Charlotte, North Carolina.

Arkansas Retail Hardware Association, May, 1923. (Place to be announced later.) L. P. Biggs, Secretary, 815-816 Southern Trust Building, Little Rock, Arkansas.

National Retail Hardware Association, Richmond, Virginia, June, 1923. Herbert P. Sheets, Secretary-Treasurer, Argos, Indiana.

Southeastern Retail Hardware and Implement Association, covering Tennessee, Alabama, Georgia and Florida. (Date and place to be announced later.) Walter Harlan, Secretary-Treasurer, 701 Grand Theater Building, Atlanta, Georgia.

Retail Hardware Doings

Illinois.

Walter B. Piper has opened a hardware store at 1019 Eighth Street, LaSalle.

Michigan.

At Harvard, A. Griswold and Son have sold their hardware stock to Guilfoyl and Company.

The Michigan Builders Hardware Company, 9000 Oakland Avenue, Detroit, has been incorporated with a capital stock of $13,000 common and $12,000 preferred.

Minnesota.

F. H. Peterson and Ole Pedersen have opened a hardware store at Willmar.

Ohio.

The Aker-Blackburn Company of Canton has been incorporated for $10,000. They are arranging to open a hardware and specialty store in the new Zinninger block, Third Street. N. W. C. L. Aker and Bertha Aker are the incorporators.

At East Canton, The Wallace Hardware Company has been incorporated with a capital stock of $10,000. The incorporators are V. C. Wallace, C. A. Shreve, W. R. Wallace, Frank Nelson and F. N. Shreve.

Wisconsin.

The hardware store of N. N. Saalsaa at Argyle has been destroyed by fire.

The Tolzman and Gensman Hardware Company at Slinger has been enlarged.

Study and Interpretation of Advertisements.

You Can Make Your Advertisements More Gainful by Avoiding the Faults and Profiting by the Good Qualities of Others.

"Every Day Is Dollar Day at Our Store" asserts the Towner Hardware Company in a well composed ad in the Muskegon, Michigan *Chronicle*. The layout is built around a cleverly drawn figure "1," with a shaded dollar-sign in background and ink sketches of pleased customers placed in upright panel in the figure.

Every Day Is Dollar Day at Our Store
See These Dollar Day Specials in Our House Furnishing Department
Six Quart, Covered Grey Enamel
Convex Kettle
A Bargain at 75c. Special for Dollar Day, Two for $1.00
American Steel Wool
The great Aluminum Cleaner. Regular price 10c a package. Special for Dollar Day, 13 pkgs. $1.00
1½ Quarts Aluminum
Sauce Pan
"Mirro" Brand, regular price 90c. Special for Dollar Day, at 59c
Special "Mirro" Aluminum
Preserving Set
Consisting of one 10-qt. Kettle, one Fruit Funnel, one Measuring Cup, one Ladle $1.98
This is a good item. Do not miss it. If our stock becomes exhausted we will take your order and make delivery later.
Percolators
"Mirro" Make
2-qt. Colonial Pattern . $1.89
3-qt. Colonial Pattern . $2.19
2-qt. Plain Pattern . $1.69
3-qt. Plain Pattern . $2.09
Mixing Bowls
One set of 5 Bowls, worth $1.25. We have sold them for a dollar. Special for Dollar Day, only .. 92c
Brooms
Ask for the B. O. E. A good grade all Corn Parlor Broom, worth 75c. Special for Dollar Day 46c
Miss Dandy, the best Parlor Broom made, worth $1.25, but our regular price is a Dollar. Special for Dollar Day. Two for ... $1.69
Stoves
At our regular marked prices, but if you buy on Dollar Day we will give you absolutely Free merchandise as per your selection, equal to 10 Per Cent of the price of stove you buy. This applies to all Stoves except Majestic Ranges.
Hand Painted Fancy China
Not marked down but we will make a 20 Per Cent Reduction from our regular prices on Dollar Day.
Clothes Lines
A pure white braided Cotton Line, highest quality, regular price 40c. Special for Dollar Day, Two for 69c
Towner Hardware Company
The Store Where Your Dollar Does Its Duty

This drawing helps to "set off" the whole ad, which is, however, commendable for many other features. "Dollar Day" at Towner's is "bargain day" rather than a special sale of dollar-priced articles, although it will be noted that two articles are "special" at this price.

Observe, also, what a large number of articles, for the space allowed, are listed in this ad, and also how there is a pleasing typographical dress to it. This is because the price figures are in large, bold type. Not only is there a variety of articles offered, but there is a tempting stove offer, as follows:

"Stoves at our regular marked prices, but if you buy on Dollar Day we will give absolutely free merchandise as per your selection equal to 10 per cent of the price of the stove you buy. This applies to all stoves except Majestic ranges."

* * *

In offering quality and service, M. A. Sharka & Company is pretty certain of getting the attention of the most of the buyers of Rhinelander, Wisconsin. He keeps his customers' attention thereafter by sticking strictly to his subject—the exposition of a certain make stoves, furnaces, and ranges.

Quality! Service!
These are remembered long after cost is forgotten.
When buying refinements for the home it is always cheapest in the long run to buy the best. You cannot buy a better range at any price than the one that bears the
MOORE SEAL OF QUALITY
We have on hand all kinds of Moore Heaters, Furnaces, Combination and Kitchen Ranges.
All Ranges with water tanks attached.
PAY US A CALL
M. A. SHARKA & CO.
213 South Brown Street.
"DEALERS IN GOOD HARDWARE"

Review of Conditions in the Metal Markets.

General Situation in the Steel Industry. Report of Prices and Tendencies in Sheet Metals, Pig Iron, etc.

Big Copper Merger Leads Non-Ferrous Developments.

The purchase of the Chile Copper Company by the Anaconda Copper Company was the outstanding event in the metals market in the past week, for close observers see in the move an ambition on the part of the purchaser, following its acquisition of American Brass, to assume a place in the copper industry analagous to that held by the United States Steel Corporation in its field. The absorption of this low cost producer naturally stiffened prices some. Prices in tin, lead and zinc have not yielded, and nearly all the markets are reported firm and strong.

Copper.

The domestic copper market opened strong this week, and practically all the copper sellers returned to the 14c delivered, basis for electrolytic, the past week. Sales for domestic account for January delivery have been of fair aggregate size and a good hand-to-mouth foreign business has been done. The recovery in sterling exchange to above $4.53 has helped the export situation.

Foundry activities continue to grow, in view of the large amount of casting work required for railroad car journals, automobile and plumbing supply purposes. Casting copper prices have held 13.40c to 13.50c, refinery.

Zinc.

Renewed foreign demand is a stimulating factor in the zinc market. Large sales for export were reported in New York City, while in East St. Louis the price was about $1 higher at 7.10 to 7.15 cents. Sellers were firm in their belief that the midmonth statistics would show a position in their favor. The London premium for prompt showed too great a spread over futures.

Domestic inquiry has been light, as consumers have been getting through shipments started when the traffic situation was tightest. High grade zinc has been selling at 8 to 8.25 cents, delivered.

Lead.

The lead market has been firm, but quiet, with outside sellers quoting 7c, East St. Louis, 7.25c to 7.35c, New York, against the Smelting company's prices of 6.90c, St. Louis, 7.10c, New York. Shipments to battery, cable and pigment makers continue heavy and all these trades are preparing for an active winter. A very fair inquiry of a varied sort is reported by producers.

The large buyers are showing caution in their bookings at any fixed prices, and by far the larger proportion of engagements are on an average contract basis. But the volume of output seems hardly yet to have overtaken the scale of consumption which shows but little seasonal slackening, such as might be looked for at this time of the year.

Solder.

Chicago warehouses quoted solder prices as follows: Warranted, 50-50, per 100 pounds, $24.00; 50-50, per 100 pounds, $25.00; $23.50; and Plumbers', per 100 pounds, $22.25.

Tin.

Following the November 30 publication of unfavorable statistics, the tin market eased off, but during the past week gradually strengthened in tone until it had reached 37 cents, while the London market went to £179 7s.

The world's visible supply of tin increased during November by 2,435 tons, according to statistics published by the New York Metal Exchange in conjunction with the London Metal Exchange. Later these figures were altered to 2,384 tons.

Straits shipments, amounting to 6,295 tons, were heavier than expected. American deliveries were up to the average of the year.

The total United States visible supply at the end of November was 13,757 tons, compared with 12,869 tons the end of October. The present visible supply here is itemized as follows: Stock in warehouses, 1,149 tons; landing, 1,550 tons; tin afloat, 11,058 tons.

Bolts and Nuts.

First quarter business for bolts and nuts is expected to be maintained on the old basis in the Chicago territory. Consumers are seeking to place contracts for first quarter requirements with producers and the latter are willing to book the business at the prevailing schedule of discounts. Whether this level can be maintained remains to be seen, but it seems likely that business for first quarter of next year will be on approximately the present price basis. Specifications on contracts are coming out and operations are at a fair rate.

In the Pittsburgh district first quarter inquiries for nuts, bolts and rivets are more numerous and several fair tonnages have been closed. In the spot market the usual end-of-the-year dull period prevails. Makers are looking ahead to Jan. 15 with expectations that by that time more sizeable business will develop.

Nails and Wire.

Excellent nail and wire business is reported by Pittsburgh makers, and good business with a slightly lessened inquiry in the Chicago territory.

While some mixed carload business, wire, nails, and fencing, from jobbers is noted from time to time, the big buying movement against spring needs of farmers holds off,

despite spring terms available. Only in one or two cases is such buying encountered, one valley producer reporting a brisk demand by its agricultural trade.

A slight let up in nail business, which for several weeks past has been so heavy, now is reported but all makers have a splendid backlog on which their nail departments are operating nearly to capacity. Wire and nails still are quoted at 2.45c and 2.70c, base Pittsburgh, respectively, and the Cambria Steel Co., which has been maintaining prices $1 per ton in advance of those levels, has met the market in this locality.

Tin Plate.

Tin plate for cans, food containers, etc., is in good demand and specifications have been particularly heavy. Some of the larger can companies with annual requirements of several million base boxes, already have filed specifications for January and February needs.

Independents are intimating that $4.85 shortly must be their minimum as against the regular market price of $4.75 per base box of 100 pounds, Pittsburgh, as announced recently by the American Sheet & Tin Plate Co. Operations continue at a fairly high rate, the American company averaging 73 per cent with an increase expected shortly, and independents about 85 or 90 per cent.

Sheets.

Steel sheets to be produced by Chicago mills during first quarter of 1923 are practically covered by orders now on mill books. Consumers who are not represented in this tonnage will have to obtain their sheets elsewhere, as practically nothing remains for sale by Chicago producers. Inland Steel Co. has divided its probable production among its regular customers, all of whom took the tonnage allotted. This producer has allowed a narrow margin, which may become available late in the quarter.

Prices continue at the level which has prevailed for several weeks, 2.50c, 3.35c and 4.35c, Pittsburgh, for blue annealed, black and galvanized, respectively.

Old Metals.

Wholesale quotations in the Chicago district which should be considered as nominal are as follows: Old steel axles, $18.00 to $18.50; old iron axles, $24.50 to $25.00; steel springs, $20.50 to $21.00; No. 1 wrought iron, $18.00 to $18.50; No. 1 cast, $16.00 to $16.50, all per net tons. Prices for non-ferrous metals are quoted as follows, per pound: Light copper, 9 cents; light brass, 5 cents; lead, 4¾ cents; zinc, 3¾ cents; and cast aluminum, 14 cents. The demand for nearly all lines is heavy.

Inquiry and Sales in Chicago Pig Iron Market Grow Heavy as Turn in Market Finally Arrives.

After Long Period of Waiting Buyers Enter First Quarter Market and Sales Are Encouraging.

THE long expected turn in the Chicago pig iron market has arrived, and inquiry and sales are heavy. After a long period of waiting, buyers are coming into the market for their first quarter needs, and sales to date are encouraging.

Lots of 5,000 to 7,000 tons have been booked, and 1,000 and 2,000 tons of foundry and malleable iron figure in the week's business. Prospective tonnage is largest. Northern iron for Chicago delivery is now $28, furnace, while prices quoted in competition outside of this district figure back under $28, furnace. The low point apparently was $27 and it is probable that this cannot be done now.

Southern iron has reached $21, Birmingham, though some makers are holding for $23 and others for $25. The sale of 1,000 tons of southern iron at $22, furnace, is reported. One thousand tons of malleable iron were sold to a Wisconsin user. Inquiry includes lots of 3,000 to 5,000 tons, several 1,000 tons and more of 200 to 500 tons. Detroit and Toledo furnaces are selling in western Michigan at $26, furnace, this territory usually buying in Chicago.

Lake Superior charcoal iron is quiet; the price is unchanged.

A wider survey of the iron and steel industry indicates an activity in future buying of a breadth not present in the market in some months.

Practically all the new business is for 1923 delivery and the estimated requirements upon which consumers now are closing indicates that manufacturing programs for the first three to six months are pitched on a large scale. Some uneveness in prices is delevoping as mill books have run down in certain lines but there is an absence of weakness anywhere. Iron and steel production is about stationary this week.

This week there has been much more interest in the market. Sales have been larger—and the difficulties of the situation are not the dominant feature. Shipments have been much heavier. The railroads have been able to supply more cars and move freight faster. In fact, the betterment in railroad conditions is most marked and while there are still some systems which are in trouble yet speaking generally the traffic problem, while serious, is not acute.

As yet there has not been enough buying to stabilize prices. But the downward movement has been checked—and buyers are not having it wholly their own way. Sellers are more and more determined to hold things steady.

Makers of agricultural implements are doing much better. They look for 1923 to be a banner year. The farmers have been in such shape since the war that their purchasing power has been nil. But they are again in the market and the great shops that turn out implements for the working of the crops are beginning again to be busy.

INLAND
COPPER ALLOY SHEETS

REDUCE SHOP COSTS

Increase the Life of

Furnaces, Tanks,
Roofs and Ventilators

INLAND
BASIC OPEN HEARTH
STEEL PRODUCTS

INLAND STEEL COMPANY
38 South Dearborn St. :: :: Chicago

Works:
Indiana Harbor, Ind.
Chicago Heights, Ill.

Branch Offices:
Milwaukee St. Louis
St. Paul

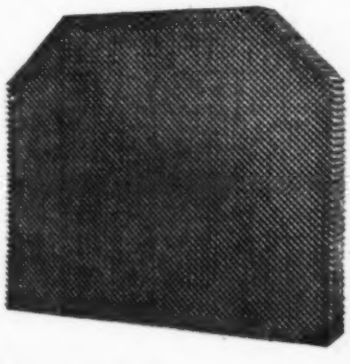
Order Ahead—

Avoid small shipments and put the difference in shipping charges in your pocket. Figure out now what you will need (Ford radiators and cores) and get it in one economical shipment from our nearest depot. You can always wire us and have a core on the way before night—but it's better to have it under the bench!

CORE
G&O
Radiator
SERVICE

THE G & O MFG. CO.

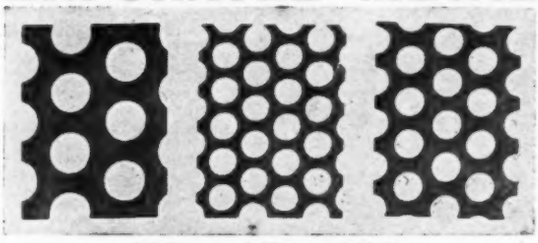
"Replacement Department" NEW HAVEN, CONN.



For prompt service shipments can be made from stock core depots in

BALTIMORE BIRMINGHAM
BOSTON CLEVELAND
DAYTON DETROIT
INDIANAPOLIS
MONTREAL
NEWARK NEW YORK
PHILADELPHIA
PITTSBURGH
RALEIGH, N. C. ROCHESTER
SPRINGFIELD, MASS.
TORONTO WILMINGTON

PERFORATED METALS



All Sizes and Shapes of Holes
In Steel, Zinc, Brass, Copper, Tinplate, etc.
For All Screening, Ventilating and Draining
EVERYTHING IN PERFORATED METAL

THE HARRINGTON & KING PERFORATING CO.
610 NORTH UNION ST.—CHICAGO, ILL., U. S. A.
NEW YORK OFFICE, 114 LIBERTY ST.

THE HESSLER

PLUMBERS

ROOF FLASHING

The very best one made

The Plumbers Know

Write for particulars today

H. E. HESSLER CO.
Sole Manufacturers
SYRACUSE, NEW YORK
Former Manufacturers of the McGuire

Current Hardware and Metal Prices.

AMERICAN ARTISAN AND HARDWARE RECORD is the only publication containing Western Hardware and Metal prices corrected weekly.

METALS

PIG IRON.

Chicago Foundry..	28 00
Southern Fdy. No. 2	27 01 to 28 01
Lake Sup. Charcoal	36 15
Malleable	28 00

FIRST QUALITY BRIGHT TIN PLATES.

		Per Box
IC	14x20 112 sheets	$10 00
IX	14x20.....	11 25
IXX	14x20.....	12 60
IXXX	14x20.....	13 90
IXXXX	14x20.....	15 25
IC	20x28.....	20 00
IX	20x28.....	22 50
IXX	20x28.....	25 20
IXXX	20x28.....	27 80
IXXXX	20x28.....	30 50

COKE PLATES.

Cokes, 180 lbs...	20x28	$11 80
Cokes, 200 lbs...	20x28	12 00
Cokes, 214 lbs...IC	20x28	12 35
Cokes, 270 lbs...IX	20x28	14 10

BLUE ANNEALED SHEETS.

Base .....per 100 lbs. $4 00

ONE PASS COLD ROLLED BLACK.

No. 18-20.....per 100 lbs.	$4 65
No. 22-24.....per 100 lbs.	4 70
No. 26.....per 100 lbs.	4 75
No. 27.....per 100 lbs.	4 80
No. 28.....per 100 lbs.	4 85
No. 29.....per 100 lbs.	4 95

GALVANIZED.

No. 16.....per 100 lbs.	$5 10
No. 18-20.....per 100 lbs.	5 25
No. 22-24.....per 100 lbs.	5 40
No. 26.....per 100 lbs.	5 55
No. 27.....per 100 lbs.	5 70
No. 28.....per 100 lbs.	5 85
No. 30.....per 100 lbs.	6 35

BAR SOLDER.

Warranted.
50-50 .....per 100 lbs. $25 00

Commercial
45-55 .....per 100 lbs. 23 50
Plumbers ....per 100 lbs. 22 25

ZINC.

In Slabs 8 60

SHEET ZINC.

Cask lots, stock.....10¾c
Less than cask lots.....11½c

COPPER.

Copper Sheets, base.....21¼c

LEAD.

American Pig	$ 7 75
Bar	8 50
Sheet.	
Full coils ....per 100 lbs.	10 00
Cut Coils .....per 100 lbs.	10 25

TIN.

Pig Tin .....per lb. 39½c
Bar Tin 42c

HARDWARE, SHEET METAL SUPPLIES, WARM AIR HEATER FITTINGS AND ACCESSORIES.

ADZES.

Coopers'.
Barton's .....Net
White's .....Net

AMMUNITION.

Shells, Loaded, Peters.
Loaded with Black Powder 18%
Loaded with Smokeless Powder 18%
Winchester.
Smokeless Repeater Grade .....20 & 4%
Smokeless Leader Grade .....20 & 4%
Black Powder .....20 & 4%
U. M. C.
Nitro Club .....20 & 4%
Arrow .....20 & 4%
New Club .....20 & 4%
Gun Wads—per 1000.
Winchester 7- 8 gauge 10&7½%
" 9-10 gauge 10&7½%
" 11-28 gauge 10&7½%

ASBESTOS.

Paper up to 1/16.....6c per lb.
Rollboard .....6¼ c per lb.
Millboard 3/32 to ⅛....6c per lb.
Corrugated Paper (250 sq. ft. to roll)....$6.00 per roll

AUGERS.

Boring Machine.....40&10%
Carpenter's Nut 50%
Hollow.
Stearns No. 4, doz.....$1150
Post Hole.
Iwan's Post Hole and Well 35%
Vaughan's, 4 to 9 in.....$15 60

AWLS.

Brad.
No. 3 Handled..per doz. $0 65
No. 1050 Handled " 1 40
Patent asst'd, 1 to 4 " 35
Harness.
Common .....per doz. $1 05
Patent ..... " 1 00
Peg.
Shouldered ..... " 1 60
Patented ..... " 75
Scratch.
No. IS. Socket Handled .....per doz. $2 50
No. 344 Goodell-Pratt, list less.....35-40%
No. 7 Stanley.....per doz. $2 25

AXES.

First Quality, Single Bitted (unhandled), 3 to 4 lb., per doz.....$13 50
Good Quality, Single Bitted, same weight, per doz. 12 50

BALANCES, SPRING.

Universal.
Sight Spring.....List less 25%
Straight .....List less 25%

BARS, CROW.

Steel, 4 ft., 10 lb.....$ 80
Steel, 5 ft., 18 lb..... 1 40
Pinch bars, 5½ ft., 24 lb..... 1 60

BARS, WRECKING.

V. & B. No. 12.....	$0 34
V. & B. No. 24.....	0 43
V. & B. No. 324.....	0 57
V. & B. No. 30.....	0 48
V. & B. No. 330.....	0 62

BEVEL, TEE.

Stanley's Rosewood handle, new list .....Nets
Stanley iron handle.....Nets

BINDING CLOTH.

Zinc 55%
Brass 40%
Brass, plated 60%

BITS.

All Vaughan and Bushnell.

Screw Driver, No. 30, each	$ 27
Screw Driver, No. 1, each	16
Reamer, No. 80, each...	41
Reamer, No. 100, each...	41
Countersink, No. 13, each..	20
Countersink, Nos.14-15 each	27

BLADES, SAW.

Wood.
Atkins 30-in.

Nos.	6	40	26
	$8 90	$9 45	$5 40

BLOCKS.

Wooden 45%
Patent 45%

BLOW TORCHES (See Firepots).

BOARDS.

Stove.	Per Doz.
26x26, wood lined.....	$14 45
28x28, " "	16 95
30x30, " "	19 00
26x26, paper lined.....	8 15
28x28, " "	9 10
30x30, " "	10 80
Wash.	
No. 760, Banner Globe (single) .....per doz.	$5 25
No. 652, Banner Globe (single) .....per doz.	6 75
No. 801, Brass King, per doz.	8 25
No. 860, Single—Plain Pump	6 25

BOLTS.

Carriage, Machine, etc.
Carriage, cut thread, ⅝x6 and sizes smaller and shorter 50%
Carriage sizes, larger and longer than ⅝x6.....40-5%
Machine, ⅝x4 and sizes smaller and shorter.....50%
Machine, sizes larger and longer than ⅝x4.....75%
Stove 75-10%
Mortise, Door.
Gem, iron 5%
Gem, bronze plated.....5%
Barrel.
Cast .....Net
Wrought ..... "
Wrought, bronzed ..... "
Flush.
Wrought .....Net
Spring.
Wrought ..... "
Wrought, heavy ..... "
Square.
Wrought ..... "

BOXES.

Mail. No...	2	4	10
Per doz..	$18 00	$23 00	$29 00

Cast Iron.
Per doz. $9 50
Mitre.
Stanley's .....Net Prices
Stearns, No. 2..per doz. $30 00

BRACES, RATCHET.

V. & B. No. 444 8 in.....	$4 54
V. & B. No. 222 8 in.....	3 89
V. & B. No. 111 8 in.....	3 55
V. & B. No. 11 8 in.....	3 02

BURRS, RIVETING.

Copper Burrs only.....40-5%
Tinners' Iron Burrs only.....Net

BUTTS.

Steel, antique copper or dull brass finish—case lots—3½x3½...per dozen pairs $3 00
4x4 .... " " " 4 20
Heavy Bevel steel inside sets, case lots—.....per dozen sets 7 20
Steel bit keyed front door sets, each 1 80
Wrought brass bit keyed front door sets, each.... 3 30
Cylinder front door sets, each 7 50

CALIPERS.

Double .....Net
Inside and Outside..... "
Wing ..... "

CARRIERS.

Hay.
Diamond, Regular...each, net
Diamond, Sling..... " "

CASTERS.

Standard—Ball Bearing. .....50 & 10%
Bed 40%
Common Plate.
Brass Wheel 15%
Iron and porcelain wheels, new list 50%
Philadelphia Plate, new list 50%
Martin's 40%

CATCHERS, GRASS.

No. 160S.....per doz.	$12 25
No. 165S..... " "	14 01

CEMENT, FURNACE.

American Seal, 5 lb. cans, net	$ 45
" " 10 lb. cans, "	90
" " 25 lb. cans, "	2 00
Asbestos, 5 lb. cans "	45
Pecora.....per 100 lbs.	7 51

CHAINS.

Proof Coil, ⅜" 100 lbs....	$ 8 75
Weldless Coil, ...	50-5%
Electric Cow Welded Ties, No. 00, 4½, per doz.....	2 85
Safety.	
12 yds., per box.....	75
500 ft. spools, per ft....	02

CHALK, CARPENTERS'.

Blue .....per gro.	$2 00
Red ..... " "	2 00
White ..... " "	1 80
Common White School Crayon... " "	0 30

CHIMNEY TOPS.

Iwan's Complete Rev. & Vent. 30%
Iwan's Iron Mountings only..35%

CHECK, DOOR.

Corbin .....Net list
Russwin .....Net list

CHISELS.

Cold.
V. & B. No. 25, ¼ in., each $0 26
V. & B. No. 25, ⅝ in., each 41
Diamond Point.
V. & B. No. 55, ¼ in..... 0 31
V. & B. No. 55, ½ in..... 0 48
Firmer Bevelled.
Round Nose.
V. & B. No. 65, ¼ in..... 0 29
V. & B. No. 65, ½ in..... 0 40
Socket Firmer.
Cape.
V. & B. No. 50, ⅜ in..... 0 31
V. & B. No. 50, ¾ in..... 0 57

CHUCKS, DRILL.

Goodell's, for Goodell's Screw Drivers.....List less 35-40%
Yankee, for Yankee Screw Drivers $6 00

CLAMPS.

Adjustable.
Martin's 30%
No. 63, Screw.....20%
No. 100, Door (Stearns) doz. $22 00
Cabinet.
Screw 20%
Carpenters'.
Steel Bar..List price plus 20%
Carriage Makers'.
2½-inch.....per doz. $ 7 00
5 - " ..... " 14 00
8 - " ..... " 28 00
12 - " ..... " 42 00
Hose.
Sherman's brass, ¾-inch per doz. $0 48
Double, brass, ¾-inch, per doz. 1 20
Saw Filers.
No. 1, Adjustable (Stearns) doz. .....$ 8 75

CLAWS, TACK.

Wood hdl. No. 10.per doz.	$1 15
Forged steel, wood hdl.	"	2 15
Solid steel	"	3 25
Giant	"	50

CLEVISES.

Malleable .....10c lb.

CLIPPERS.

Bolt (Carolus).
No. 0.....$2 50
No. 1..... 3 25
No. 3..... 4 25

CLIPS.

Axle ..... 65 & 5%
Damper.
Acme, with tail pieces, per doz. $1 25
Non Rivet tail pieces, per doz. 25
Non Rivet Clips..... 90
Hame 50

COLLARS, STOVE PIPE.

Lacquered.

Inches	5	6	7
Fancy pattern, per doz.	65c	75c	$4 00

COMPASSES.

Carpenters' 15%

COPPERS—Soldering.

Pointed Roofing.

3 lb. and heavier....per lb.	40c
2½ lb..... "	45c
2 lb..... "	48c
1½ lb..... "	55c
1 lb..... "	60c

CORD.

No. 7 Std. per doz. hanks..	$ 9 85
No. 8 " " " "	11 40

SHEETS

GALVANIZED 10 to 29 Gauge
BLACK 18 to 29 Gauge
BLUE ANNEALED 10 to 16 Gauge

LARGE STOCKS

Corrugated Sheets for Roofing and Siding
All Gauges, Standard Widths and Lengths

PROMPT SHIPMENTS

WRITE TODAY FOR PRICES

THE SYKES COMPANY *930 West 19th Place CHICAGO, ILLINOIS*

AREX

Make bigger profits. Install this better Ventilator.

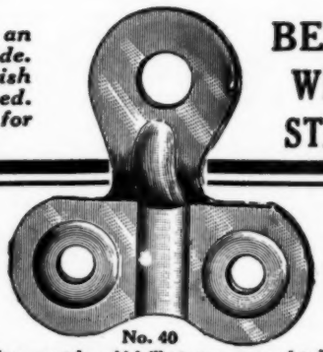
EVERY ventilating job using AREX VENTILATORS is a profitable and successful job. Notice the Siphonage principle—the AREX ventilates naturally, evenly and effectively. Exhausts three times as much air as others and is strong, rigid, light and easy to install. Absolutely storm-proof and it has no movable parts.

You'll be interested in the profits you can make with the AREX. Write today for catalog and price list.

AREX COMPANY, Room 1581 Conway Bldg. 111 W. Washington St., Chicago, Ill.

This is as fine an ear as can be made. Perfect, fine finish and nicely tinned. Write today for samples.

BERGER'S WROUGHT STAR EARS



Furnished in gross boxes or in bulk to suit the purchaser

We can furnish sizes 20, 30 & 40 stamped from sheet brass.

No. 40

Write today for our catalog which illustrates our complete line of ears

BERGER BROS. CO.
229 to 237 ARCH STREET
WAREROOMS AND FACTORY: 100 to 114 BREAD STREET
PHILADELPHIA, PA.

KANT-BREAK LADDER

THAT'S the name of the ladder and also the reason why it can hold the aggregate weight of six men.

A Steel Rod in each rung
A Steel Insert on both edges

of each upright and only the best materials used in its construction.

That's the proof of why they can't break. Contractors who believe in "Safety First" buy the best ladder—

KANT-BREAK

Walchli Mfg. Company
4711 St. Louis Avenue ST. LOUIS, MO.

Plecker's Galvanized Eave Trough and Corrugated Expanding Conductors

Made of Keystone Copper Bearing Steel

Cost no more Lasts longer Therefore Cheapest

CLARK-SMITH HARDWARE CO. - - PEORIA, ILLINOIS

"THE STANDARD"

VENTILATOR and CHIMNEY CAP

DOES away with high stacks, swings reely in the slightest breeze and positively cures down-drafts. The strongest and most efficient combination to be had. Has no equal for chimney purposes. All jobbers sell them—write your jobber or us for prices and catalog today.

Manufactured by
STANDARD VENTILATOR CO.
LEWISBURG, PA.

COTTERS, SPRING.
All sizes 37½%

COUPLINGS, HOSE.
Brass.....per doz. $2 25

CUT-OFFS.
Standard gauge.....35%
26 gauge.....20%
Kuehn's Korrekt Kutoffs:
Galv., plain, round or cor. rd.
Standard gauge 40%
26 gauge 10%

DAMPERS, STOVE PIPE.
Diamond.
6-inch.....per doz. $1 50
Cast "American."
6 inch per doz.....$1 50
7 " " " 2 25
8 " " " 3 60
9 " " " 5 40
10 " " " 6 75
12 " " " 8 00
Check.
7 inch, each.....$1 00
8 " " 1 25
9 " " 1 50
10 " " 1 75
12 " " 2 25
Steel Hot Air.
8 inch per doz.....$2 50
9 " " 2 75
10 " " 3 00
12 " " 3 50
14 " " 4 50

DIGGERS.
Post Hole.
Iwan's Split Handle (Eureka)
4-ft. Handle...per doz. $14 00
7-ft. Handle...per doz. 36 00
Iwan's Hercules pattern, per doz. 14 90

DRILLS.
V. & B. Star, 12-inch Length.
¼, 5/16 and ⅜, each.....$ 25
⅝, each 36
1, each 54
1¼, each 81
V. & B. Star, 18-inch Length.
5/16 and ⅜, each.....$ 33
⅝, each 45
1, each 69
1¼, each 1 05

EAVES TROUGH.
79% of Standard List.
Milcor .....
Galv. Crimpedge, crated.....75%

ELBOWS—Conductor Pipe.
Galvanized Steel, Tin and Terne
Plain Round or Round Corrugated
2 to 6 inch, Std. gauge ..65%
2 to 6 inch, 26 gauge 45%
2 to 6 inch, 24 gauge 20%
Milcor .....
Galv., plain or corrugated, round flat.
Crimp. Std. gauge.....65%
26 Gauge Std. gauge.....45%
24 Gauge Std. gauge.....15%
Square Corrugated.
Standard gauge 50%
26 gauge 30%
Milcor .....
Standard gauge 50%
26 gauge 35%
Portico Elbows.
Standard Gauge Conductor Pipe, plain or corrugated.
Not nested .....70 & 5%
Nested solid.....70 & 5%

ELBOWS—Stove Pipe.
1-piece Corrugated. Uniform.

	Doz.
5-inch	$1 38
6-inch	1 54
7-inch	1 98

Special Corrugated.

	Doz.
6-inch	$1 27
7-inch	1 76

Uniform, Collar Adjustable.

	Doz.
5-inch	$1 76
6-inch	1 98
7-inch	2 48

WOOD FACES—50% off list.

FENCING.
Lawn fence, single space, 36-inch .....$ 9 12
Lawn fence, single space, 42-inch 10 20
Lawn fence, double space, 32-inch 12 50
Lawn fence, double space, 42-inch 13 75
Field fence, 26-inch, No. 10 top and bottom 12 filling 26 50
Same, 6 filling..... 33 82
Field fence, 32-inch, No. 10 top and bottom 12 filling 30 34
Same, 6 filling..... 39 41

FILES AND RASPS.
Heller's (American).....65-5%
American 65-5%
Arcade .....60 & 10%
Black Diamond 50-5%
Eagle 60-10%
Great Western .....60 & 10%
Kearney & Foot.....60 & 10%
McClellan .....60 & 10%
Nicholson 50-10%
Simonds 60%
J. Barton Smith.....50-10-5%
X F .....Net list

FIRE POTS.
Clayton & Lambert's.
East of west boundary line of Province of Manitoba, Canada, No. Dakota, So. Dakota, Nebraska, Kansas, Oklahoma, Amarillo, San Angelo and Laredo, Texas 55%
West of above boundary line.52%

Turner Brass Works.	Ea.
No. 43 Kerosene-Gasolene Master Torch, 1 qt.....$5 40	
No. 48 Kerosene-Gasolene Master Torch, 1 qt..... 6 73	
No. 95 Double Jet Torch, Gasolene, 1 qt..... 6 95	
No. 30 Kerosene-Gasolene Torch, 1 qt. (new line).. 6 48	
No. 33 Single Jet Gasolene Torch, 1 qt..... 6 93	
No. 53 Plbrs. Furn. Galv. Iron Tank with Bulb, 7 pts. 6 75	
No. 63 Plbrs. Furn. Galv. Iron Tank with Pump, 7 pts. 7 47	
No. 56 Plbrs. Furn. Straight Side Steel Tank with Bulb, 7 pts..... 8 82	
No. 66 Plbrs. Furn. Straight Side Steel Tank, with Pump, 7 pts..... 9 54	

Otto Bernz Co.
No. 1 Furn. Gasolene with large shield, 1 gal.....$ 6 75
No. B Furn. Kerosene, 1 gal. 15 12
No. 10 Brazier, Kerosene or Gasolene, 10 gals... 47 52
No. 5 Torch, Gasolene or Kerosene, 1 pt..... 7 92
No. 83 Torch, Gasolene, 1 quart 5 40
No. 86 Torch, Gasolene, 1 pt. 4 05

GALVANIZED WARE.

	Per doz.
Pails (Competition), 8-qt...	$1 85
10-qt.	2 00
12-qt.	2 35
14-qt.	2 50
Wash tubs, No. 1.....	5 85
No. 2	7 00
No. 3	7 75

GARAGE DOOR HARDWARE.
Stanley .....All net

GAUGES.
Marking, Mortise, etc.....Nets
Wire.
Disston's 25%

GIMLETS.
Discount.....65% and 10%

GLASS.
Single Strength, A. and B. all sizes.....83 & 84%
Double Strength, A, all sizes 79%
Double Strength, B, all sizes, 85%

GLUE.
Bulk.
B Amber .....per lb. 35c
A White ..... " 40c
H. S. Amber..... " 32c
Liquid.
Army & Navy.....40%
Le Page's—
List "A" 37½%
List "B" .....35 %
List "C" .....25 %

GREASE, AXLE.
Wood Boxes.
Frazer's .....per gro. 13 00
Hub Lightning 7 50
Wood Pails.
Frazer's, 15 lb., $1.00; 25 lb., $1.50 each.
Hub Lightning, 15 lb., 90c; 25 lb., $1.21 each.

HAFTS, AWL.
Brad.
Common .....per doz. $0 35
Peg.
Patent, plain top. " 60
Patent, leather top " 80
Sewing.
Common ..... " 24
Patent ..... " 55

HAMMERS, HANDLED.

All V. and B.	Each, net
Blacksmiths' Hand, No. 0, 26-oz. $1 00	
Engineers' No. 1, 26-oz..... 1 00	
Farriers', No. 7, 7-oz..... 93	
Machinists', No. 1, 7-oz.... 78	
Nail.	
Vanadium, No. 41, 20-oz., each 1 45	
Vanadium, No. 41½, 16-oz., each 1 45	
V. & B., No. 11½, 16-oz., each 1 04	
Garden City, No. 111½, 16-oz., each 87	
Tinner's Riveting, No. 1, 8-oz., each 82	
Shoe, Steel, No. 1, 13-oz., each 65	
Tack.	
Magnetic.	
No. 5, 4-oz., each..... 72	

HAMMERS, HEAVY.
Farrier's 20%
Mason's.
Single and Double Face....50%

HANDLES.
Agricultural Tool.
4½-inch, plain...per doz. $3 50
Auger.
Common Assorted, per doz. $0 75
Pratt's Adjustable, Nos. 1 & 2, per doz..... 6 00
Ives' Adjustable, per set.. 1 35
Axe.
Hickory, No. 1....per doz. 3 00
Hickory, No. 2.... " 2 00
1st quality, second growth 6 00
Special white, 2nd growth 4 50
Chisel.
Hickory, Tanged, Firmer Assorted .....per doz. 55c
Hickory, Socket Firmer, Assorted .....per doz. 70c
Coal Pick 40%
Drifting Pick 40%
File, ...per doz. $1 20
Hammer and Hatchet.
No. 1 per doz.....$0 90
Second growth hickory, per doz. 1 40
Hay and Manure Fork, Handles, Strap and Ferrule ..... per doz. $7 00
Screw Driver.
Assorted .....each 6c
Shovel and Spade.....Net
Soldering.
Per doz. $2 40

HANGERS.
Conductor Pipe.
Milcor Perfection Wire.....25%
Eaves Trough.
Steel hangers 30%
Triple Twist wire.....10%
Milcor Eclipse Wire.....15%
Milcor Triplex Wire.....10%
Milcor Milwaukee Extension..10%
Milcor Steel (galv. after forming) List plus 12½%
Milcor Selflock E. T. Wire, List plus 40%

HASPS.
Hinge, Wrought, with staples.Net

HATCHETS.

V. and B. Supersteel.	Each
Broad, No. 1, 24-oz.....$1 43	
Broad, No. 3, 32-oz..... 1 78	
Half, No. 1, 15-oz..... 1 25	
Half, No. 3, 27-oz..... 1 37	
Claw, No. 1, 19-oz..... 1 31	
Claw, No. 2, 25-oz..... 1 37	
Flooring, No. 1, 20-oz..... 1 43	
Flooring, No. 2, 24-oz..... 1 60	
Shingling, No. 1, 17-oz..... 1 20	
Shingling, No. 2, 23-oz..... 1 25	
Lathing, No. 1, 14-oz..... 1 20	
Lathing, No. 2, 17-oz..... 1 25	
Vanadium Steel.	
Half, No. 62, 22-oz.....$1 82	
Underhill Pattern Lathing, 9 row, 19-oz..... 2 29	

HINGES.
Heavy Strap, in Bundles.
4 inch, doz. prs.....$0 93
5 " " " 1 12
6 " " " 1 54
8 " " " 2 55
Extra Heavy T in Bundles.
4-inch, doz. prs.....$1 41
5 " " " 1 50
6 " " " 1 85
8 " " " 3 20

HOES.
Garden .....Net

HOOKS.
Box.
V. and B. No. 9, each....$0 26
Conductor.
Conductor hooks 20-10%
Milcor .....
"Direct Drive" Wrought Iron for wood or brick..15%
Cotton.
V. and B. No. 8, each.... 24
Hay.
V. and B. No. 1, each.... 26
Bar Meat.
V. and B. No. 26, ⅜", each 09
V. and B. No. 28, ½", each 16
Screw Meat.
V. and B. No. 2, per gro.. 6 50
Butchers' "S."
V. and B. No. 6, each..... 08
V. and B. No. 8, each..... 11

HOSE.

	Per Ft.
⅝-in. 2 ply molded..	9½c to 12¾c
⅝-in. cord	8½c to 10c
¾-in. wrapped	9½c to 13½c

IRONS.
Sad.
Charcoal .....per doz. 11 00
Common, polished, per 100 lbs. 7 75
No. 70 Asbestos.....$1 50 net
No. 100 " ..... 1 75 net
Common, nickel plated 8 25
Mrs. Potts.'
No. 50 J. Enterprise, per set Nets
No. 55 J, " " "
No. 50 T, " " "
No. 55 T, " " "
E. C. Stearns.'
No. OA Corner, doz. sets.$2 50
No. OB " " " 2 75

JACKS.
Wagon.
Richard's No. 1.per doz. $15 50
Oliver,
Each $0 60 $0 80
Nos. 0 00
Standard,
Each $0 60 $1 00
Nos. 1 2
Big Lift 40%
Tiger 40%

KNIVES.
Beet Topping.
Clyde, 9-in. Scimitar Blade, doz. 25%
California 25%
Butcher.
Beechwood Handles, 6-inch blade 25%
Beechwood Handles, 7-inch blade 25%
Beechwood Handles, 8-inch blade 25%
Cooper's Hoop 25%
Drawing.
Standard 25%
Adjustable 25%
Barton's Carpenters' 25%
Hay.
Iwan's Solid Socket.....25%
Heath's 25%
Iwan's Sickle Edge.....25%
Iwan's Imp'd Serrated....25%
Hedge.
Challenge 25%
Disston's No. 1.....25%
Putty.
Common 25%
Lander's 25%
Scraping.
Beech Handle 25%
Lander's 25%

KNOBS.
Door.
Mineral .....per doz. $2 00
Porcelain ..... " 2 00
Jet ..... " 2 00

LADDERS.
Step.
Common, per ft.....28c
Common, with Shelf, add 10c
IXL 34c
Challenge, 6 to 9 ft.....55c
10 to 16 ft.....60c

LANTERNS.

	Per doz.
Monarch tin, hot blast.....	$ 8 25
Dietz No. 2, cold blast.....	13 00
Best tubular	8 25
Competition lanterns No. 0 tubular	6 90

LEATHER BELTING.
From No. 1 Oak Tanned Butts.
Extra heavy, 18-oz.....35%
Heavy, 16-oz.....40%
Medium, 14½-oz.....40%
Light, 13-oz.....50%

LEATHER LACING.
Cut, strictly No. 1.....45%

LEVELS.

Disston, No. 28 Asst.....	$22 05
" No. 18, 20 in., each	1 83
" No. 22, 24 in., each	2 40
" Shafting, 6 in.....	19 80
" " 6 in. gr. glass	24 20
" No. 1 Asst.....	5 75
" No. 2 Asst.....	12 40
" 24-26 in., each....	1 02
" 28-30 in., each....	1 00

LIFTERS.
Stove Cover.
Coppered .....per gro. $6 00
Alaska ..... " 4 75
Transom.
Payson's 55%

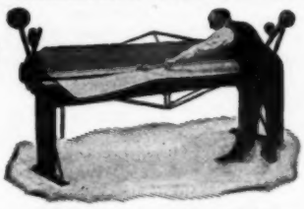
LOCKS.
Barn Door.
No. 60 Stearns..per doz. $11 00
No. 80 " " 20 00

MALLETS.
Carpenters'.
Fibre Head, No. 2, per doz. $12 00
" No. 3, " 15 50
" No. 3½ " 20 50
Round Hickory .....per doz $3 00— 5 00
Tinners'.
Hickory .....per doz. $2 25

NEW CHICAGO ROTARY SLITTING SHEAR

Used in Connection with a Cornice Brake

Guaranteed to Cut 24-Gauge Iron



Will Split a Sheet or Cut Strips at Any Angle

Write now for information

MAPLEWOOD MACHINERY CO.

Dealers in New and Used Machinery

2547-49 Fullerton Ave. CHICAGO, ILL.

Steel Ceilings Side Walls and Cornices

Only first quality material used
Many neat designs of character.

Write today for our complete catalog giving descriptions and prices.

THE W. J. BURTON CO.

Junction Ave. and Federal St. and 436 Penobscot Bldg. **Detroit, Michigan**

No. 61 Red-Hot Fire Pot

Something Worth While

Our No. 61 Coil Fire Pot is the best and most Reliable Coil Fire Pot made. Tank is made of heavy gauge, seamless drawn steel, tinned inside and out, rust proof, fitted with extra large funnel and filler plug with dust proof cap. Every mechanic should have one of these fire pots.

Jobbers supply at factory prices.
Send for free catalog.

ASHTON MFG. COMPANY
Newark, N. J., U. S. A.

No. 208 Torch
List Price, Each $17.50
Ask for Discount

"DOUBLE NEEDLE" THE TORCH OF TODAY

Modern low grade fuel has made obsolete many of the old style Torches having Burners with sharp pointed Needles. No. 208 Double Blunt Needle Torch is up-to-date, burns gasoline or kerosene perfectly, producing 300 degrees more heat. Orifice can not be injured by forcing Needle as in other makes. Upper Needle has wire tip that cleans, lower regulates flame. Jet Block is removable. It is practically foolproof. Jobbers supply at factory prices. Ask for a catalog.

CLAYTON & LAMBERT MFG. CO.
10635 Knodell Ave. DETROIT, MICH., U.S.A.

C. G. HUSSEY & CO.

Rolling Mills and Office, PITTSBURGH, PA.

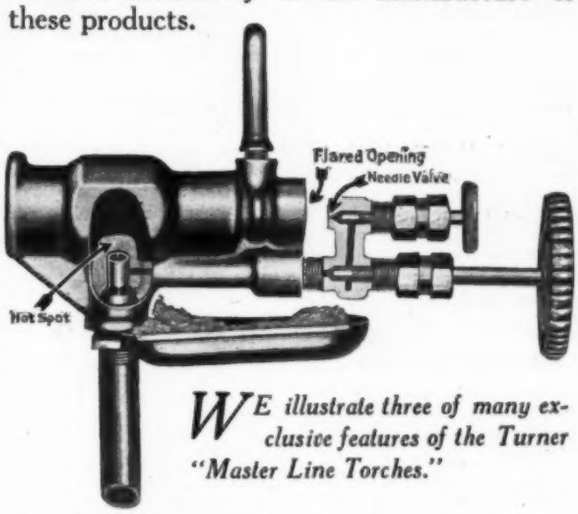
Manufacturers of

SHEET COPPER, BOTTOMS, ROLL COPPER, TINNED AND POLISHED COPPER, NAILS, SPIKES, RIVETS, CONDUCTOR PIPE, EAVES TROUGH, ELBOWS, SHOES, MITRES, ETC.

Branch Warehouses in New York, Chicago and St. Louis

Torch Makers for 50 Years

FOR 50 years the Turner Brass Works have been makers of blow torches and furnaces. Ours is the largest plant in the United States devoted exclusively to the manufacture of these products.



WE illustrate three of many exclusive features of the Turner "Master Line Torches."

1. **"The Hot Spot Hump."** The obstruction in the burner tube that becomes white hot, instantly vaporizing kerosene or gasoline. This insures a hot, dry, clean, highly inflammable gas that gives complete combustion and a hot flame.

2. **Separate Needle Valve Control.** On all other torches, operators with more muscle than brain are almost sure to enlarge the orifice by strong arm work on the control wheel. This is impossible on the Turner, because the shut off and needle valves are separate. **Results:** Positive and delicate control of flame, from full blast to fine needle point, and an orifice always just right.

3. **Flared Air Inlet,** insures the maximum percentage of **air** in the mixture. This means hottest flame with least fuel. Additional oxygen is admitted in a long slot in the top of the Burner tube, which deflects the flame positively against the "Hot Spot Hump." Note there are NO HOLES in the burner tube, one reason why the Turner "Master" Torch won't blow out.

OTHER FEATURES:

Safety Valve and Air Release, making this the only SAFE torch on the market.

Pistol Grip Handle that won't tire the operator.

Lubricated Pump Leather.

Only ONE Opening in the Tank.

Send for Turner Bulletin

THE TURNER BRASS WORKS
Sycamore, Ill. U.S.A.
Oak Street

District Representatives:

Rice-Hitt Co., 709 Mission St., San Francisco, Calif.
Rice-Hitt Co., 1427 L. C. Smith Bldg., Seattle, Wash.
Rice-Hitt Co., 417 Hibernian Bldg., Los Angeles, Calif.
Turner Brass Works, 36 Murray St., New York, N. Y.
A. H. Deveney & Co., 4th National Bank Bldg., Atlanta, Ga.

MATS.

Door.
National Rigid ....5 & 10 & 5%
Acme Steel Flexible.....50%

MEASURES.

Galvanized, doz.....Nets
Japanned, doz. .....Nets

MITRES.

Galvanized steel mitres, and caps, end pieces, outlets...30%
Milcor .....
Galv. one piece stamped....40%

MOPS.

Cotton, Star (Cut Ends).

Pounds	12'	15'	18'	24'-3-oz.
Per doz.	$4 00	4 35	5 50	7 00

Enterprise 16⅔%
Parker .....50 & 5%

NAILS.

Cut Steel $4 60
Cut Iron 4 60
Wire.
Common 3 45
Cement Coated.
Small Lots 2 30
Horseshoe.
Ausable .....55 & 5%
Capewell 15%
Perfect .....55 & 5%
Putnam .....20 & 5%
Star .....30 & 5%
Picture.
Brass Heads 25%
Brads 70%
Furniture.....List plus 15%

NETTING, POULTRY.

Galvanized before weaving...50%
Galvanized after weaving...40%

NIPPERS.

Nail Cutting.
V. & B. No. 30.....78c
Double Duty.
V. & B. No. 60.....76c
Hoof.
Heller's .....40 & 10%
V. & B., No. 52, each.....$2 25

NOZZLES.

Hose.
Magic .....per doz. $9 50
Diamond ..... " 5 75

OILERS.

Chase Pattern.
Brass and Copper.....10%
Zinc Plated.....40 & 5%
Railroad.
Brass .....20&5%
Coppered .....50&5%
Steel.
Copper Plated.....70 & 5%

OPENERS.

Can.
Delmonico .....per doz. $1 30
Never Slip ..... " 65
Crate.
V. & B....per doz. $7 25-11 00

PAILS.

Cream.
14-qt. without gauge, ...per doz. $9 50
18-qt. without gauge, ...per doz. 11 00
20-qt. without gauge, ...per doz. 11 75
Sap.
10-qt., IC Tin....per doz. $4 00
12 " " " " 5 50
Stock.

Galv. qts.	14	16	18	20
Per doz.	$9 75	10 75	12 75	14 50

Water.

Galvanized qts.	10	12	14
Per doz.	$5 75	6 50	7 25

Wood.
Cable, 2-Hoop....per doz. Nets
Cable, 3-Hoops... " Nets
Cable, 3-Hoops, brass " Nets

PANS.

Dripping .....Net
Fry.
Common .....Nets
Acme ..... "
Roasting.
Paxton,

Nos.	1	2	3	4
Per doz.				Nets

PAPER.

Roofing.	Per Square
Best grade, slate surf. prepd.	$1 85
Best talc surfaced.....	3 25
Medium talc surfaced.....	1 60
Light talc surfaced.....	0 90
Red Rosin Sheathing, per ton	55 00

PICKS.

Contractors' 40%
Railroad .....50 & 5%

PINCERS.

All V. & B.
Carpenters', cast steel,

No.	6	8	10	12
Each	$0 43	$0 52	$0 61	$0 71

Blacksmiths', No. 10.....$0 64

PINS.

Clothes.
Common, per box of 5 gro. $0 95

PIPE.

Conductor.
Plain Round and Round Corrugated.
29 Gauge .....70&5%
28 " .....70&5%
26 " .....70&5%
24 " .....70&5%
"Interlock" Galvanized.
Crated and nested (all gauges) 60-20%
Crated and not nested (all gauges) 60-15%
Square Corrugated A and B and Octagon.
29 Gauge 65%
28 " 65%
26 " 65%
24 " 65%
"Interlock."
Crated and nested (all gauges) 60-20%
Prices for Galvanized Toncan Metal, Genuine O. H. Iron, Lyonmore Metal and Keystone C. B. on application.

Stove.	Per 100 joints
26 gauge, 5 inch E. C. nested	15 40
26 gauge, 6 inch E. C. nested	16 50
26 gauge, 7 inch E. C. nested	18 70
28 gauge, 5 inch E. C. nested	13 20
28 gauge, 6 inch E. C. nested	14 30
28 gauge, 7 inch E. C. nested	16 50
30 gauge, 5 inch E. C. nested	11 00
30 gauge, 6 inch E. C. nested	12 10
30 gauge, 7 inch E. C. nested	14 30

T-Joint Made up.
6-inch .....per 100 38 50
Furnace Pipe.
Double Wall Pipe and Fittings 40%
Single Wall Pipe, Round Pipe Fittings 40%
Galvanized and Back Iron Pipe, Shoes, etc.....40%
Milcor, galvanized.....Net

PLANES.

Stanley Iron Bench.....Net

PLIERS.

(V. & B.)

Nut,	No. 3, each		$2 60
"	No. 5, each		64
"	No. 25, each		69
Gas,	No. 7, each		55
"	No. 8, each		61
"	No. 12, each		87
Lining or Crimping.			
No. 35, each			64
Button's Pattern.			
No. 6 each			61
No. 8 each			74
Double Duty, No. 106			50

POINTS, GLAZIERS.

No. 1, 2 and 3...per doz. pkgs. 65c

POKERS, STOVE.

Wr't Steel, str't or bent, ... per doz. $0 75
Nickel Plated, coil hanl's " 1 10

PULLEYS.

Awning—Jap'd 10%
Clothes Line 10%
Hay Fork.
Iron Wheel, 5-in..per doz. $2 50
Wood Wheel, 6-in. " 2 65
Wood Wheel, 6-in. pass knot ..... " 3 00
Sash.
Common .....Net
Common-Sense, 2-in .....Net
Empire Pattern, 2-in.....Net
Ideal .....Net
Steel .....Net

PUMPS.

Spray.
Midget Junior....per doz. $3 75
New Misty ..... " 6 00
Crescent ..... " 6 50

PUNCHES.

Machine.	Each
V. & B., No. 11-13, ½x6	$ 19
V. & B., No. 90, ⅝x9	27
V. & B., No. 10. ⅝x10	29
V. & B., No. 1-6, ½x6	12
Center.	
V. & B., No. 50, ⅜x4	14
Belt.	
V. & B., No. 101-103	24
V. & B., No. 108-109	33
V. & B., No. 25, ass't	3 80
Parker Metal Punch No. OX .....each	$7 00
Parker Extra Punch.	30
Parker Extra Die	40
Whitney's Ball Bearing.. .....Prices on application	

PARERS.

Apple.
Goodell's .....per doz. $10 80
Turntable ..... " 11 40
White Mountain " 8 40
Reading No. 78 " 11 40

PUTTY.

Commercial Putty, 100-lb. kits $3 60

RAKES.

Garden.	Per doz.
Steel, Bow, 12-inch Teeth	$8 50
Steel, Bow, 14-inch "	9 25
Malleable Iron, 12-in. "	4 75
Malleable Iron, 14 in. "	5 00
Hay.	
Wood, 10 Teeth	$4 00
Lawn.	
30 Teeth .....per doz.	5 50

RAZORS—SAFETY.

Gillette .....per doz. $45 00
Auto Strop ..... " 45 00
Gem ..... " 8 40
Gem (3 doz. lots).. " 8 00
Ever Ready ..... " 8 40
Ever Ready (3 dz. lots)" 8 00

RAZORS STRAIGHT.

RAZOR STROPS.

Star (Honing) 50%

FLOOR REGISTERS AND BORDERS.

Cast Iron 15%
Steel and Semi-Steel.....30%
Baseboard 30%
Adjustable Ceiling Ventilators 30%
Register Faces—Cast and Steel
Japanned, Bronzed and Plated, 4x6 to 14x14.....30%
Large Register Faces—Cast, 14x14 to 38x42.....50%
Large Register Faces—Steel, 14x14 to 38x42.....60%

REGULATORS.

(Parker Dial Damper with Bearings.)
Each .....$ 50
Per doz. 5 50

RIDGE ROLL.

Galvanized.
Crated 70-25%
Wired 70-25-5%
Milcor .....
Plain, crated 75%
Plain, bundled 75-2½%

RIVETS.

Copper Belt .....50% Discount
Coppered Iron 50%
Tinners' 50%

Hame..... per lb. $0 17

Slotted Clinch per doz. 60 @ 1 10

Tubular.
Nos. 1 and 2 assorted sizes, 50 in box.....doz. 75c
Nos. 1 and 2 assorted sizes, 10 in box.....doz. 1 40

ROPE.

Cotton.
¼, 5-16 in. and larger, per lb. .....50c to 60c
Sisal.
1st Quality, base 13½c to 15½c
No. 2.....12½c to 14½c
Manila.
1st Quality standard brands .....16½c to 18½c
No. 2 .....15½c to 16½c
Hardware Grade, per lb. 15½c

SAWS.

Butchers'.		
Atkins	No. 2, 14-in	$12 75
"	No. 2, 18-in	14 30
"	No. 7, 16-in	15 85
"	No. 2, 22-in	15 92
"	No. 7, 20-in	18 05
"	No. 7, 24-in	20 20
"	No. 7, 28-in	22 35
Compass.		
Atkins	No. 2, 10-in	$ 5 45
"	No. 10, 10-in	5 60
"	Blades, No. 2, 10-in.	3 25
"	" No. 2, 10-in.	3 30
Cross-Cut.		
Atkins	No. 221, 4-ft	3 03
"	No. 221, 6-ft	4 45
"	No. 221, 8-ft	6 07
Flooring, Hand.		
Atkins	No. 96, 16-in	20 45
"	No. 96, 20-in	21 70
Hand and Rip.		
Atkins	No. 54, 20-in	19 50
"	No. 54, 26-in	24 40
"	No. 53, 16-in	18 10
"	No. 53, 20-in	22 90
"	No. 53, 24-in	26 60
"	No. 53, 28-in	31 45
"	No. 53, 30-in	34 15
Keyhole.		
Atkins	No. 1, complete	3 10
"	No. 2, complete	3 70
Miter Box.		
Atkins	No. 1, 4x20	32 65
"	No. 1, 5x22	38 00
"	No. 1, 6x22	42 20
Pruning.		
Atkins	No. 20, 12-in	8 45
"	No. 10, 16-in	18 15
Wood.		
Atkins	No. 202	7 19
"	No. 318	8 75
"	No. 906	15 50
"	No. 1509	16 56

SCOOPS.

Hubbard Western Pattern Riveted.

Size	A	B	C	D
1..	$16 75	16 00	15 25	14 45
4..	17 85	17 10	16 35	15 60
6..	18 65	17 85	17 10	16 35

SCRAPERS.

Box.
No. 6, six blades, each.... 25c
Hog.
No. 6, each..... 25c
Floor (Stearns).
No. 10, each.....$11 50

SCREEN DOOR HINGES.

Cast iron .....gross $13 00
Steel ..... " 9 50

SCREWS.

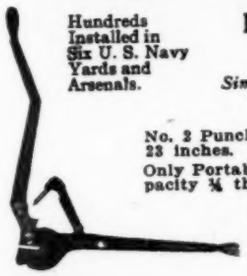
Jack.....Standard List 45%
Lag or Coach—all sizes, gimlet pointed 40-10%
Wood.
F. H. Bright.....82-5%
R. H. Blued.....75-20-5%
F. H. Jap'd.....70-20-5%
F. H. Brass.....78-5%
R. H. Brass.....70-20-5%
Sheet Metal.
No. 7, ½x½, per gross...$ 55
No. 10, ¾x3/16, per gross.. 75
No. 14, ⅞x¼, per gross... 90

SCREW DRIVERS.

Uncle Sam Standard Head.
3 inches, each.....$ 45
5 inches, each..... 52
8 inches, each..... 68
12 inches, each.....1 02
Uncle Sam Insulated Head
3 inches, each.....$ 49
5 inches, each..... 57
8 inches, each..... 76
12 inches, each.....1 14

SETS.

Nail.
V. & B.
No. 100, in cardboard boxes .....doz. $1 55
No. 100, in wooden boxes, ... doz. 1 58
No. 30, assorted.....doz. 39
No. 5, in cardboard boxes, ... doz. 1 25
No. 5, in wooden boxes, ... doz. 1 30
Rivet.
V. & B.
Farmers' $0 19
Tinners' 3-4 ..... 0 40
" 00-0 ..... 0 60
Saw.
Atkins No. 10....per doz. $3 80
" No. 12.... " 6 20



Hundreds Installed in Six U. S. Navy Yards and Arsenals.

Best by Test of Thirteen Years
Over 20,000 in use

Simplest Construction, Fewest Parts easiest Operated and Changed. Made in 4 sizes.

No. 2 Punch—Capacity 5/16 thru ¼ Iron. Length 23 inches.

Only Portable Channel Iron Punch on Market. Capacity ¼ thru ¼ Iron. Punches to center of 4 inch Channel Iron, with 1½ inch flanges.

All parts interchangeable with No. 2 Punch. No. 3 Tinner's Punch—Capacity ¼ thru 18 gauge.

No. 1 Punch—Capacity ⅜ thru ¼ Iron.

Ask your Jobber, or write us.

W. A. Whitney Mfg. Co., Rockford, Ill.

Leaders and Gutters Made From Horse Head Rolled Zinc last a life-time

The NEW JERSEY ZINC COMPANY
Established 1848
160 Front Street **New York**

Chicago: Mineral Point Zinc Co., 1111 Marquette Bldg.
Pittsburgh: The New Jersey Zinc Co., (of Pa.) 1437 Oliver Bldg.
Cleveland: The New Jersey Zinc Sales Co., 1138 Guardian Bldg.
San Francisco: The New Jersey Zinc Sales Co., 1205 Merchants Exch. Bldg

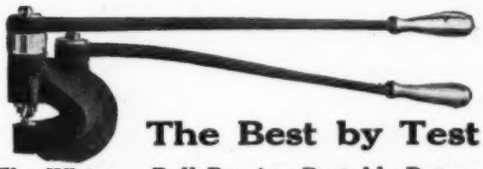
The World's Standard for Zinc Products

LIGHTNING STOVE PIPE MACHINES

Save time, money and labor. The **LIGHTNING STOVE PIPE MACHINE** is the only one on the market that will rapidly and perfectly close the seams or groove Nested Stove Pipe. Can be attached to any post, wall or bench. It is adjustable to all sizes and gauges of Stove Pipe, Furnace Pipe and other Sheet Metal articles. Simple, Rapid, Noiseless.

Write for particulars

Manufactured by
HEMP & CO., St. Louis, U.S.A.



The Best by Test

The Whitney Ball Bearing Portable Rotary Hand Metal Punch

Is the lightest, most compact, and of greatest capacity with same length of handles as any portable hand metal punch in the world.

Don't compare this Tool with the ordinary screw punch, it's different—much faster and better. Every frictioned point, Ball Bearing. All wearing parts hardened throughout.

Write Us Today for Prices

WHITNEY METAL TOOL CO.
93 Forbes St. **Rockford, Illinois.**

CORTRIGHT METAL SHINGLES

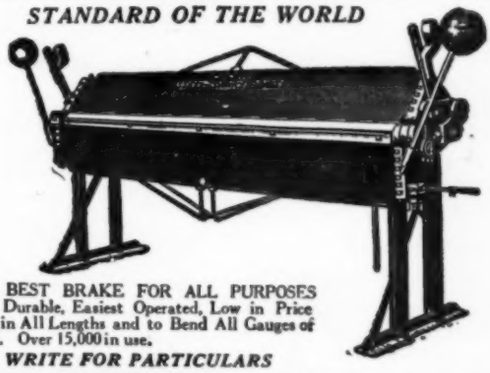
When it comes to Galvanized Shingles, use Cortright Hand Dipped. They are first formed of prime roofing tin, and then coated separately in a zinc bath, receiving a heavy coating on both sides.

Cortright Metal Roofing Co.

Philadelphia — Chicago

CHICAGO STEEL CORNICE BRAKES

STANDARD OF THE WORLD



THE BEST BRAKE FOR ALL PURPOSES
Most Durable, Easiest Operated, Low in Price
Made in All Lengths and to Bend All Gauges of Metal. Over 15,000 in use.

WRITE FOR PARTICULARS

DREIS & KRUMP MFG. CO., 2915 S. Halsted Street, CHICAGO

Please Mention
AMERICAN ARTISAN AND HARDWARE RECORD
When writing to advertisers

50-INCH FORMING ROLL

This Forming Roll is built in all standard sizes, with our Patented Opening Device by means of which it is opened and closed in a few seconds.

We build a complete line of Shears and Punches, all sizes, for hand or belt power

Write for Catalog "R"

BERTSCH & CO., Cambridge City, Ind.

Send for catalog today

VIKING SHEAR

Compound LEVER Handle — Removable Blades

A child can work them

VIKING SHEAR CO., Erie, Pa.

SHEARS.

		Per Doz.
Nickel Plated, Straight,	6″	$12 90
" " "	7″	14 85
" " "	8″	16 80
Japanned, Straight	6″	11 00
" "	7″	12 40
" "	8″	13 80

SHEAVES, SLIDING DOOR.

Common.

Inches	3	4	5
Per set	$1 40	1 75	2 40

Hatfield's.

Per set $1 80 2 10 2 75 25

SHINGLES.

Per Square

Zinc (Illinois) $15 00

SHOES.

Milcor.

Galv. Std. gauge, Plain or corg. round flat crimp...65@
26 gauge round flat crimp..45%
24 gauge round flat crimp..15@

Square Corrugated.

Standard gauge 50%
26 gauge 35%

Conductor .....60@

SHOVELS AND SPADES.

Coal.
Hubbard's.

No.	A	B	C	D
1	$16 00	15 10	14 45	13 70
2	16 35	15 60	14 85	14 10
3	16 75	16 00	16 25	14 45
4	17 10	16 35	16 60	14 85

Post Drains & Ditching.
Hubbard's.

Size	A	B	C
14″	17 15	16 40	15 65
16″	17 50	16 75	16 00
18″	17 85	17 10	16 85
20″	18 20	17 45	16 70
22″	18 55	17 80	17 05

Alaska Steel.

D-Handle .....per doz. $3 50
Long Handle ..... " 2 00

SKATES.

Roller.

Ball Bearing—Boys' $1 50
Ball Bearing—Girls' 1 60

Ice.

Key Clamp Rocker, Men's and Boys' 0 70
Key Clamp Rocker, Men's and Boys' 1 03
Half Key Clamp Hockey, Women's and Girls'.... 0 96

SNAPS, HARNESS.

Covered Spring .....Add 30%
Judd's Pattern Add 33 1-6% to list

SNATHS.

Double Ring Bush..per doz. $9 75
Patent Loop, Bush.. " 10 00
Patent Loop, Grass. " 8 75

SNIPS, TINNERS'.

Clover Leaf .....40&10%
National .....40&10%
Star 50%
Milcor .....Net

SPRINGS, DOOR.

Perfect.

Nos.	2	3	4	5	6	7
Per doz.	45c	50c	55c	65c	80c	90c

Reliance.

	Light	Medium	Heavy
Per doz...	$1 80	2 40	3 75

Torrey's .....per doz. 1 65

SQUARES.

Steel and Iron.....Net
(Add for bluing, $3.00 per doz. net)
Mitre ..... "
Try ..... "
Try and Bevel..... "
Try and Miter..... "
Fox's .....per doz. $6 00
Winterbottom's 10%

STAPLES.

Blind.

Barbed .....per lb. 21@22c

Butter, Tub..... " 16@19c

Fence—

Polished .....per 100 lbs. $5 45
Galvanized ... " 6 15

Netting.

Galvanized ...per 100 lbs. 6 54

Wrought.

Wrought Staples, Hasps and Staples, Hasps, Hooks and Staples, and Hooks and Staples .....50&10%
Extra heavy 35%

STONES.

Axe.

Hindostan	....per lb.	New Nets
More Grit	.... "	"
Washita	..... "	"

Emery.

No. 126.....per doz. New Nets

Oil—Mounted.

Arkansas Hard No. 7	.....per doz.	New Nets
Arkansas Soft	"	"
Washita No. 717	"	"

Oil—Unmounted.

Arkansas Hard	per lb.	New Nets
Arkansas Soft	"	"
Lily White	.. "	"
Queer Creek	.. "	"
Washita	..... "	"

Scythe.

Black Diamond	per gro.	New Nets
Crescent	.... "	"
Green Mountain	"	"
LaMolle	..... "	"
Extra Quinnebog	..... "	"
Red End	..... "	"

STOPS, BENCH.

No. 10 Morrill pattern .....per doz. $11 00
No. 11 Stearns pattern ..... " 10 00
No. 15 Smith pattern " 7 00

STOPPERS, FLUE.

Common .....per doz. $1 10
Gem, flat, No. 3... " 1 00
Gem, No. 1..... " 1 10

STRETCHERS.

Carpet.

Bullard's .....per doz. $3 90
Excelsior ..... " 5 25
Malleable Iron ... " 70
Perfection ..... " 6 30
King ..... " 4 50

Wire.

O. S. Elwood, No. 1 per doz. Nets
O. S. Elwood, No. 2 " "

SWIVELS.

Malleable Iron .....per lb. $0 10
Wrought Steel .....per gro. 4 50

TACKS.

Bill Posters' 6-oz. 25-lb. boxes per lb. 15c
Upholsterers' 6-oz., 25-lb. boxes, per lb.....15½c

TAPES, MEASURING.

Asses' Skin .....List&40%

THERMOMETERS.

Tin Case .....per doz. 80c&$ 1 25
Wood Back... " $2 00& 12 00
Glass ..... " 12 00

TIES.

Bale.

Single Loop, carload lots .....75&7%
Single Loop, less than car lots .....70&15%

TRAPS.

Mouse and Rat.	Per gross
Sure Catch Mouse Traps..$	2 10
Vim Mouse Traps.....	2 10
Short Stop Mouse Traps.	1 80
Wood Choker Mouse Traps, 4 hole.....	10 25
	Per doz.
Sure Catch Rat Traps....$	0 90
Dead Easy Rat Traps....	80

Packed in One Bushel Band Stave Baskets.

	List per bushel
Sure Catch Mouse Traps (360 Traps) .....$	5 25
Short Stop Mouse Traps (360 Traps)	4 50
Sure Catch Rat Traps (54 Traps)	3 60
Short Stop Rat Traps (54 Traps)	3 15

Assorted Mouse and Rat Traps.

	List per bushel
Sure Catch (216 Mouse Traps and 26 Rat Traps)$	4 90
Short Stop (216 Mouse Traps and 26 Rat Traps)	4 25

TROWELS.

Cement.

Atkins	No. 6.....	19 50
"	No. 9.....	25 50

TWINE.

White Cotton.

Eureka, 4-ply .....per lb. 30c

Jute.

3-ply and 6-ply Bale Lots 22½c

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Wegener Mfg. Co..... —
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Doz.	$11 15	13 00	14 85
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⅞ in., per 100 ft..... 1 56

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